

Figure 1A. Amino acid sequence of secreted ColoUp1 protein
(I) (SEQ ID NO: 1)

TVAAGCPDQSPQLPWNPGHDQDHHVHIGQGKTLTSSATVYSIHISEGGKLVIKDHD
EPIVLRTRHILIDNGGELHAGSALCPFQGNFTIILYGRADEGIQPDPPYGLKYIGVGKG
GALELHGQKKLSWTFNLKTLHPGGMAEGGYFFERSWGHARGVIVHVIDPKSGTVIHSDF
DTYRSKKESERLVQYLNAVDPGRILSVAVNDEGSRNLDDMARKAMTKLGSKHFLHLGFR
HPWSFLTVMGNPSSSVEDHIEYHGHRGSAAARVFKLFQTEHGEYFNVSLSSEWVQDVEW
TEWFDHDKVSQTKGGEKISDLWKAHPGKICNRPIDIQATTMDGVNLSTEVVYKKGQDYR
FACYDRGRACRSYRVRFLCGKPVPRPKLTVTIDTNVNSTILNLEDNVQSWKPGDTLVIAS
TDYSMYQAEFQVLPCRSCAPNQVKVAGKPMYLIHIGEEIDGVDMAEVGLLSRNIIVMG
EMEDKCYPYRNHICNFFDFDTFGGHIKFALGFKAHLEGTELKHMGGQLVGQYPIHFHL
AGDVDERGGYDPTYIRDLSTHHTFSRCVTVHGSNGLLIKDVVGYNLSLGHCFETEDGPE
ERNTFDHCLGLLVKSGTLLPSDRDSKMCKMITEDSYPGYIPKPRQDCNAVSTFWMANPN
NNLINCAAAGSEETGFWFIFHHVPTGPSVGMSPGYSEHILPGKFYNNRAHSNYRAGMI
IDNGVKTTEASAKDKRPFLSIISARYSPHQDADPLKPREPAIRHFIAAYKNQDHGAWLR
GGDVWLDSCRFDNGIGLTLASGGTFPYDDGSKQEIKNLSLVGSGNVGTEMMDNRIWG
PGGLDHSGRTLPIGQNFPIRGIQLYDGPINIQNCTFRKFVALEGRHTSALAFLNNAWQ
SCPHNNVTGIAFEDVPITSRVFFGEPGPWFNQDMDGDKTSVFHDVDGVSVEYPGSYLT
KNDNWLVRHPDCINVPDWRGAICSGCYAQMYIQAYKTSNLRMKIIKNDFPSHPLYLEGA
LTRSTHYQQYQPVVTLQKGYTIHWDQTAPAEALAIWLINFNKGDWIRVGLCYPRGTTFSI
LSDVHNRLKQTSKTGVFVRTLQMDKVEQSYPGRSHYYWDEDSGLLFLKLKAQNEREF
AFCSMKGCEKIKALIPKNAGVSDCTATAYPKFTERAVVDVPMKKLFGSQLKTKDHF
LEVKMESSKQHFHLWNDFAIIEVDGKKYPSSSEDGIQVVVIDGNQGRVVSHTSFRNSIL
QGIPWQLFNIVATIPDNSIVLMASKGRYVSRGPWTRVLEKLGADRGLKLKEQMAFVGFK
GSFRPIWVTLDTEDHKAKIFQVVPIPVVKKKKL

Figure 1B. Amino acid sequence of secreted ColoUp1 protein (II) (SEQ ID NO: 2)

AGCPDQSPQLQPNPGHDQDHHVHIGQGKTLTSSATVYSIHISEGGKLVIKDHDEPI
VLRTRHILIDNGGELHAGSALCPFQGNFTIILYGRADEGIQPDPIYGLKYIGVGKGGAL
ELHGQKKLSWTFNLKTLHPGGMAEGGYFFERSWGHARGVIVHVIDPKSGTVIHSRFDY
RSKKESERLVQYLNAVDPGRILSVAVNDEGSRNLDDMARKAMTKLGSKHFLHLGFRHPW
SFLTVMGNPSSSVEDHIEYHGHRGSAAARVFKLFQTEHGEYFNVSLSSSEWVQDVEWTEW
FDHDKVSQTKGGEKISDLWKAHPGKICNRPIDIQATTMDGVNLSTEVVYKKGQDYRFAC
YDRGRACRSYRVRFLCGKPVRPKLTVTIDTNVNSTILNLEDNVQSWKPGDTLVIASTDY
SMYQAEFQVLPCRSCAPNQVKVAGKPMYLIHIGEEIDGVDMAEVLGSLSRNIIVMGEME
DKCYPYRNHICNFFDFDTFGGHIKFAFGKAAHLEGTELKHMGGQLVGQYPIHFHLAGD
VDERGGYDPPTYIRDLSIHHTFSRCVTVHGSNGLLIKDVVGYNLSLGHCFFTEDGPEERN
TFDHCLGLLVKSGTLLPSDRDSKMCKMITEDSYPGYIPKPRQDCNAVSTFWMANPNNNL
INCAAAGSEETGFWFIFHHVPTGPSVGMSPGYSEHIPLGKFYNNRAHSNYRAGMIIDN
GVKTTEASAKDKRPFLSIISARYSPHQDADPLKPREPAIRHFIAYKNQDHGAWLRGGD
VWLDSRCFADNGIGLTLASGGTFPYDDGSKQEIKNSLFVGESGNVGTMMNDNRIWGP
LDHSGRTLPIGQNFPIRGIQLYDGPINIQNCTFRKFVALEGRHTSALAFRLNNAWQSCP
HNNVTGIAFEDVPITSRVFFGEPGPWFNQLDMDGDKTSVFHDVDGSVSEYPGSYLT
KNLWVRHPDCINVPDWRGAICSGCYAQMYIQAYKTSNLRMKIKNDFPSHPLYLEGALTR
STHYQQYQPVVTLQKGYTIHWDQTAPAEIAIWLINFNKGDWIRVGLCYPRGTTFSILSD
VHNRLKQTSKTGVFVRTLQMDKVEQSYPGRSHYYWDEDSGLLFLKLKAQNEREKFAFC
SMKGCERIKIKALIPKNAGVSDCTATAYPKFTERAVVDVPMPPKKLFGSQLKTKDHFLEV
KMESSKQHFFHLWNDFAFYEVDGKKYPSSDGIQVVVIDGNQGRVVSHTSFRNSILQGI
PWQLFNYVATIPDNSIVLMASKGRYVSRGPWTRVLEKLGADRGLKLKEQMAFVGFKGSF
RPIWVTLDTEHAKIFQVVPPIPVVKKKKL

Figure 2. Amino acid sequence of secreted ColoUp2 protein
(SEQ ID NO: 3)

LQEVHVSKETIGKISAASKMMWCSAAVDIMFLLDGSNSVGKGSFERSKHFAITVCDGLD
ISPERVRVGAFQFSSTPHLEFPLDSFSTQQEVKARIKRMVFKGGRTETELALKYLLHRG
LPGGRNASVPQILIIVTDGKSQGDVALPSKQLKERGVTVFAVGVRFPWRWHEELHALASEP
RGQHVLLAEQVEDATNGLFSTLSSSAICSSATPDCRVEAHPCEHRTLEMVREFAGNAPC
WRGSRRTLAVLAAHCPFYSWKRVLTHPATCYRTTCPGPCDSQPCQNGGTCVPEGLDGY
QCLCPLAFGGEANCALKLSLECRVDLLFLLDSSAGTTLDGFLRAKVFKRFVRAVLSED
SRARVGVATYSRELLVAVPVGEYQDVVDLVWSLDGIPFRGGPTLTGSALRQAAERGFGS
ATRGTQDRPRRVVLLTESHSEDEVAGPARHARARELLLLGVGSEAVRAELEEITGSPK
HVMVYSDPQDLFNQIPELQGKLCRQRPGCRTQALDLVFMLDTSASVGPENFAQMOSFV
RSCALQFEVNPDVTQVGLVYGSQVQTAFGLDTKPTRAAMLRAISQAPYLGGVGSAGTA
LLHIYDKVMTVQRGARPGVPKAVVVLTGGRGAEDAAVPAQKLRNNGISVLVVGVPVLS
EGLRRLAGPRDSLHVAAYADLRYHQDVLI EWLCGEAKQPVNLCKPSPCMNEGSCVLQN
GSYRCKCRDGWEGPHCENRFLRRP

Figure 3. Nucleic acid sequence of ColoUp1 (SEQ ID NO: 4)

CGTGACACTGTCTCGGCTACAGACCCAGAGGGAGCACACTGCCAGGATGGGAGCTGCTG
GGAGGCAGGACTTCCTCTTCAAGGCCATGCTGACCATCAGCTGGCTCACTCTGACCTGC
TTCCCTGGGGCCACATCCACAGTGGCTGCTGGGTGCCCTGACCAGAGCCCTGAGTTGCA
ACCCTGGAACCCTGGCCATGACCAAGACCACCATGTGCATATCGGCCAGGGCAAGACAC
TGCTGCTCACCTCTTCTGCCACGGTCTATTCCATCCACATCTCAGAGGGAGGCAAGCTG
GTCATTAAAGACCACGACGAGCCGATTGTTTTGCGAACCCGGCACATCCTGATTGACAA
CGGAGGAGAGCTGCATGCTGGGAGTGCCCTCTGCCCTTTCAGGGCAATTTACCATCA
TTTTGTATGGAAGGGCTGATGAAGGTATTCAGCCGGATCCTTACTATGGTCTGAAGTAC
ATTGGGGTTGGTAAAGGAGGCGCTCTTGAGTTGCATGGACAGAAAAAGCTCTCCTGGAC
ATTTCTGAACAAGACCCTTCACCCAGGTGGCATGGCAGAAGGAGGCTATTTTTTTGAAA
GGAGCTGGGGCCACCGTGGAGTTATTGTTTCATGTCATCGACCCAAATCAGGCACAGTC
ATCCATTCTGACCGGTTTGACACCTATAGATCCAAGAAAGAGAGTGAACGTCTGGTCCA
GTATTTGAACGCGGTGCCCGATGGCAGGATCCTTTCTGTTGCAGTGAATGATGAAGGTT
CTCGAAATCTGGATGACATGGCCAGGAAGGCGATGACCAAATTGGGAAGCAAACACTTC
CTGCACCTTGGATTTAGACACCCTTGGAGTTTTCTAACTGTGAAAGGAAATCCATCATC
TTCAGTGAAGACCATATTGAATATCATGGACATCGAGGCTCTGCTGCTGCCCGGGTAT
TCAAATTGTTCCAGACAGAGCATGGCGAATATTTCAATGTTTCTTTGTCCAGTGAGTGG
GTTCAAGACGTGGAGTGGACGGAGTGGTTCGATCATGATAAAGTATCTCAGACTAAAGG
TGGGGAGAAAATTTAGACCTCTGGAAAGCTCACCCAGGAAAAATATGCAATCGTCCCA
TTGATATACAGGCCACTACAATGGATGGAGTTAACCTCAGCACCGAGGTGTCTACAAA
AAAGGCCAGGATTATAGGTTTGCTTGCTACGACCGGGGCAGAGCCTGCCGGAGCTACCG
TGTACGGTTCTCTGTGGGAAGCCTGTGAGGCCCAAACCTCACAGTCACCATTGACACCA
ATGTGAACAGCACCATTCTGAACTTGGAGGATAATGTACAGTCATGGAAACCTGGAGAT
ACCCTGGTCATTGCCAGTACTGATTACTCCATGTACCAGGCAGAAGAGTTCCAGGTGCT
TCCCTGCAGATCCTGCGCCCCCAACCAGGTCAAAGTGGCAGGGAAACCAATGTACCTGC
ACATCGGGGAGGAGATAGACGGCGTGGACATGCGGGCGGAGGTTGGGCTTCTGAGCCGG
AACATCATAGTGATGGGGGAGATGGAGGACAAATGCTACCCCTACAGAAACCACATCTG
CAATTTCTTTGACTTCGATACCTTTGGGGGCCACATCAAGTTTGCTCTGGGATTTAAGG
CAGCACACTTGGAGGGCACGGAGCTGAAGCATATGGGACAGCAGCTGGTGGGTGAGTAC
CCGATTCACTTCCACCTGGCCGGTGATGTAGACGAAAGGGGAGGTTATGACCCACCCAC
ATACATCAGGGACCTCTCCATCCATCATACTTCTCTCGCTGCGTCACAGTCCATGGCT
CCAATGGCTTGTGATCAAGGACGTTGTGGGCTATAACTCTTTGGGCCACTGCTTCTTC
ACGGAAGATGGGCCGGAGGAACGCAACACTTTTGACCACTGTCTTGGCCTCCTTGTCAA
GTCTGGAACCCTCCTCCCCTCGGACCGTGACAGCAAGATGTGCAAGATGATCACAGAGG
ACTCCTACCCAGGGTACATCCCCAAGCCCAGGCAAGACTGCAATGCTGTGTCCACCTTC
TGGATGGCCAATCCCAACAACAACCTCATCAACTGTGCCGCTGCAGGATCTGAGGAAAC
TGGATTTTGGTTTATTTTTTACCACGTACCAACGGGCCCTCCGTGGGAATGTACTCCC
CAGGTTATTTCAGAGCACATTCCACTGGGAAAATTCTATAACAACCGAGCACATTCCAAC
TACCGGGCTGGCATGATCATAGACAACGGAGTCAAAACCACCGAGGCCTCTGCCAAGGA
CAAGCGGCCGTTCTCTCAATCATCTCTGCCAGATACAGCCCTCACCAGGACGCCGACC
CGCTGAAGCCCCGGGAGCCGGCCATCATCAGACACTTCATTGCCTACAAGAACCAGGAC
CACGGGGCCTGGCTGCGCGGCGGGGATGTGTGGCTGGACAGCTGCCGGTTTGCTGACAA
TGGCATTGGCCTGACCCTGGCCAGTGGTGGAACTTCCCGTATGACGACGGCTCCAAGC
AAGAGATAAAGAACAGCTTGTTTGTGGCGAGAGTGGCAACGTGGGGACGGAAATGATG
GACAAATAGGATCTGGGGCCCTGGCGGCTTGGACCATAGCGGAAGGACCCCTCCCTATAGG

CCAGAATTTTCCAATTAGAGGAATTCAGTTATATGATGGCCCCATCAACATCCAAAAC
GCACTTTCCGAAAGTTTGTGGCCCTGGAGGGCCGGCACACCAGCGCCCTGGCCTTCCGC
CTGAATAATGCCTGGCAGAGCTGCCCCATAACAACGTGACCGGCATTGCCTTTGAGGA
CGTTCCGATTACTTCCAGAGTGTTCTTCGGAGAGCCTGGGCCCTGGTTCAACCAGCTGG
ACATGGATGGGGATAAGACATCTGTGTTCCATGACGTCGACGGCTCCGTGTCCGAGTAC
CCTGGCTCCTACCTCACGAAGAATGACAACTGGCTGGTCCGGCACCCAGACTGCATCAA
TGTTCCCGACTGGAGAGGGGCCATTTGCAGTGGGTGCTATGCACAGATGTACATTCAAG
CCTACAAGACCAGTAACCTGCGAATGAAGATCATCAAGAATGACTTCCCCAGCCACCCT
CTTTACCTGGAGGGGGCGCTCACCAGGAGCACCCATTACCAGCAATACCAACCGGTTGT
CACCTGCGAGAAGGGCTACACCATCCACTGGGACCAGACGGCCCCCGCCGAACTCGCCA
TCTGGCTCATCAACTTCAACAAGGGCGACTGGATCCGAGTGGGGCTCTGCTACCCGCGA
GGCACCACATTCTCCATCCTCTCGGATGTTCACAATCGCCTGCTGAAGCAAACGTCCAA
GACGGGCGTCTTCGTGAGGACCTTGACAGATGGACAAAGTGGAGCAGAGCTACCCTGGCA
GGAGCCACTACTACTGGGACGAGGACTCAGGGCTGTTGTTTCTGAAGCTGAAAGCTCAG
AACGAGAGAGAGAAGTTTGCTTTCTGCTCCATGAAAGGCTGTGAGAGGATAAAGATTAA
AGCTCTGATTCCAAAGAACGCAGGCGTCAGTGACTGCACAGCCACAGCTTACCCCAAGT
TCACCGAGAGGGCTGTCTGTAGACGTGCCGATGCCCAAGAAGCTCTTTGGTTCTCAGCTG
AAAACAAAGGACCATTCTTGGAGGTGAAGATGGAGAGTTCCAAGCAGCACTTCTTCCA
CCTCTGGAACGACTTCGCTTACATTGAAGTGGATGGGAAGAAGTACCCAGTTTCGGAGG
ATGGCATCCAGGTGGTGGTGATTGACGGGAACCAAGGGCGCGTGGTGAGCCACACGAGC
TTCAGGAACTCCATTCTGCAAGGCATACCATGGCAGCTTTTCAACTATGTGGCGACCAT
CCCTGACAATTCCATAGTGCTTATGGCATCAAAGGGAAGATACGTCTCCAGAGGCCCAT
GGACCAGAGTGCTGGAAAAGCTTGGGGCAGACAGGGGTCTCAAGTTGAAAGAGCAAATG
GCATTTCGTTGGCTTCAAAGGCAGCTTCCGGCCCATCTGGGTGACACTGGACACTGAGGA
TCACAAAGCCAAAATCTTCCAAGTTGTGCCCATCCCTGTGGTGAAGAAGAAGAAGTTGT
GAGGACAGCTGCCGCCCCGGTGCCACCTCGTGGTAGACTATG

Figure 4. Nucleic acid sequence of ColoUp2 (SEQ ID NO: 5)

GCCCCCTGGCCCGAGCCGCGCCCGGGTCTGTGAGTAGAGCCGCCCGGGCACCGAGCGCT
 GGTGCGCCGCTCTCCTTCCGTTATATCAACATGCCCCCTTTCTCTGTTGCTGGAAGCCGTC
 TGTGTTTTCTGTTTTTCCAGAGTGCCCCCATCTCTCCCTCTCCAGGAAGTCCATGTAAG
 CAAAGAAACCATCGGGAAGATTTTCACTGCGCAGCAAAATGATGTGGTGCTCGGCTGCAG
 TGGACATCATGTTTCTGTTAGATGGGTCTAACAGCGTCGGGAAAGGGAGCTTTGAAAGG
 TCCAAGCACTTTGCCATCACAGTCTGTGACGGTCTGGACATCAGCCCCGAGAGGGTCAG
 AGTGGGAGCATTCCAGTTCAGTTCCACTCCTCATCTGGAATCCCCTTGGAATCATTTT
 CAACCCAACAGGAAGTGAAGGCAAGAATCAAGAGGATGGTTTTTCAAAGGAGGGCGCACG
 GAGACGGAACCTTGCTCTGAAATACCTTCTGCACAGAGGGTTGCCTGGAGGCAGAAATGC
 TTCTGTGCCCCAGATCCTCATCATCGTCACTGATGGGAAGTCCCAGGGGGATGTGGCAC
 TGCCATCCAAGCAGCTGAAGGAAAGGGGTGTCACTGTGTTTGCTGTGGGGGTGAGGTTT
 CCCAGGTGGGAGGAGCTGCATGCACTGGCCAGCGAGCCTAGAGGGCAGCACGTGCTGTT
 GGCTGAGCAGGTGGAGGATGCCACCAACGGCCTCTTCAGCACCTCAGCAGCTCGGCCA
 TCTGCTCCAGCGCCACGCCAGACTGCAGGGTTCGAGGCTCACCCCTGTGAGCACAGGACG
 CTGGAGATGGTCCGGGAGTTTCGCTGGCAATGCCCCATGCTGGAGAGGATCGCGGCGGAC
 CCTTGCGGTGCTGGCTGCACACTGTCCCTTCTACAGCTGGAAGAGAGTGTTCTTAACCC
 ACCCTGCCACCTGCTACAGGACCACCTGCCCAGGCCCTGTGACTCGCAGCCCTGCCAG
 AATGGAGGCACATGTGTTCCAGAAGGACTGGACGGCTACCAGTGCCTCTGCCCCGCTGGC
 CTTTGAGGGGAGGCTAACTGTGCCCTGAAGCTGAGCCTGGAATGCAGGGTCGACCTCC
 TCTTCTGCTGGACAGCTCTGCGGGCACCCTCTGGACGGCTTCCTGCGGGCCAAAGTC
 TTCGTGAAGCGGTTTTGTGCGGGCCGTGCTGAGCGAGGACTCTCGGGCCCGAGTGGGTGT
 GGCCACATACAGCAGGGAGCTGCTGGTGGCGGTGCCTGTGGGGGAGTACCAGGATGTGC
 CTGACCTGGTCTGGAGCCTCGATGGCATTCCCTTCCGTGGTGGCCCCACCCTGACGGGC
 AGTGCCTTGCGGCAGGCGGCAGAGCGTGGCTTCGGGAGCGCCACCAGGACAGGCCAGGA
 CCGGCCACGTAGAGTGGTGGTTTTTGCTCACTGAGTCACACTCCGAGGATGAGGTTGCGG
 GCCCAGCGCGTCACGCAAGGGCGCGAGAGCTGCTCCTGCTGGGTGTAGGCAGTGAGGCC
 GTGCGGGCAGAGCTGGAGGAGATCACAGGCAGCCCAAAGCATGTGATGGTCTACTCGGA
 TCCTCAGGATCTGTTCAACCAAATCCCTGAGCTGCAGGGGAAGCTGTGCAGCCGGCAGC
 GGCCAGGGTGCCGGACACAAGCCCTGGACCTCGTCTTCATGTTGGACACCTCTGCCTCA
 GTAGGGCCCGAGAATTTTGCTCAGATGCAGAGCTTTGTGAGAAGCTGTGCCCTCCAGTT
 TGAGGTGAACCCTGACGTGACACAGGTGCGCCTGGTGGTGTATGGCAGCCAGGTGCAGA
 CTGCCTTCGGGCTGGACACCAAACCCACCCGGGCTGCGATGCTGCGGGCCATTAGCCAG
 GCCCCCTACCTAGGTGGGGTGGGCTCAGCCGGCACCCGCCCTGCTGCACATCTATGACAA
 AGTGATGACCGTCCAGAGGGGTGCCCGGCCTGGTGTCCCCAAAGCTGTGGTGGTGCTCA
 CAGGCGGGAGAGGCGCAGAGGATGCAGCCGTTCCCTGCCCAGAAGCTGAGGAACAATGGC
 ATCTCTGTCTTGGTCGTGGGCGTGGGGCCTGTCTTAAGTGAGGGTCTGCGGAGGCTTGC
 AGGTCCCCGGGATTCCCTGATCCACGTGGCAGCTTACGCCGACCTGCGGTACCACCAGG
 ACGTGCTCATTGAGTGGCTGTGTGGAGAAGCCAAGCAGCCAGTCAACCTCTGCAAACCC
 AGCCCGTGTCATGAATGAGGGCAGCTGCGTCCTGCAGAATGGGAGCTACCGCTGCAAGTG
 TCGGGATGGCTGGGAGGGCCCCCACTGCGAGAACCGATTCTTGAGACGCCCCCTGAGGCA
 CATGGCTCCCGTGCAGGAGGGCAGCAGCCGTACCCCTCCAGCAACTACAGAGAAGGCC
 TGGGCACTGAAATGGTGCTACCTTCTGGAATGTCTGTGCCCCAGGTCTTAGAATGTC
 TGCTTCCCGCCGTGGCCAGGACCACTATTCTCACTGAGGGAGGAGGATGTCCCAACTGC
 AGCCATGCTGCTTAGAGACAAGAAAGCAGCTGATGTACCCACAAACGATGTTGTTGAA
 AAGTTTTGATGTGTAAGTAAATACCCACTTTCTGTACCTGCTGTGCCTTGTTGAGGCTA

TGTCATCTGCCACCTTTCCCTTGAGGATAAACAAGGGTCCTGAAGACTTAAATTTAGC
GGCCTGACGTTTCCTTTGCACACAATCAATGCTCGCCAGAATGTTGTTGACACAGTAATG
CCCAGCAGAGGCCTTTACTAGAGCATCCTTTGGACGG

Figure 5. Nucleic acid sequence of Osteopontin (SEQ ID NO: 6)

GCAGAGCACAGCATCGTCGGGACCAGACTCGTCTCAGGCCAGTTGCAGCCTTCTCAGCC
AAACGCCGACCAAGGAAAACACTACTACCATGAGAATTGCAGTGATTTGCTTTTGCCTCC
TAGGCATCACCTGTGCCATAACAGTTAAACAGGCTGATTCTGGAAGTTCTGAGGAAAAG
CAGCTTTACAACAAATACCCAGATGCTGTGGCCACATGGCTAAACCCTGACCCATCTCA
GAAGCAGAATCTCCTAGCCCCACAGACCCTTCCAAGTAAGTCCAACGAAAGCCATGACC
ACATGGATGATATGGATGATGAAGATGATGATGACCATGTGGACAGCCAGGACTCCATT
GACTCGAACGACTCTGATGATGTAGATGACACTGATGATTCTCACCAGTCTGATGAGTC
TCACCATTCTGATGAATCTGATGAACTGGTCACTGATTTTCCACGGACCTGCCAGCAA
CCGAAGTTTTCACTCCAGTTGTCCCCACAGTAGACACATATGATGGCCGAGGTGATAGT
GTGGTTTATGGACTGAGGTCAAAATCTAAGAAGTTTCGCAGACCTGACATCCAGTACCC
TGATGCTACAGACGAGGACATCACCTCACACATGGAAAAGCGAGGAGTTGAATGGTGCAT
ACAAGGCCATCCCCGTTGCCCAGGACCTGAACGCGCCTTCTGATTGGGACAGCCGTGGG
AAGGACAGTTATGAAACGAGTCAGCTGGATGACCAGAGTGCTGAAACCCACAGCCACAA
GCAGTCCAGATTATATAAGCGGAAAGCCAATGATGAGAGCAATGAGCATTCCGATGTGA
TTGATAGTCAGGAACCTTTCCAAAGTCAGCCGTGAATTCCACAGCCATGAATTTACAGC
CATGAAGATATGCTGGTTGTAGACCCCAAAGTAAGGAAGAAGATAAACACCTGAAATT
TCGTATTTCTCATGAATTAGATAGTGCATCTTCTGAGGTCAATTAAAAGGAGAAAAAAT
ACAATTTCTCACTTTGCATTTAGTCAAAAGAAAAAATGCTTTATAGCAAAATGAAAGAG
AACATGAAATGCTTCTTTCTCAGTTTATTGGTTGAATGTGTATCTATTTGAGTCTGGAA
ATAACTAATGTGTTTGATAATTAGTTTAGTTTGTGGCTTCATGGAACTCCCTGTAAAC
TAAAAGCTTCAGGGTTATGTCTATGTTCACTTCTATAGAAGAAATGCAAATCTACTGT
ATTTTAATATTTGTTATTCTCTCATGAATAGAAATTTATGTAGAAGCAAACAAAATACT
TTTACCCACTTAAAAAGAGAATATAACATTTTATGTCACTATAATCTTTTGTTTTTTAA
GTTAGTGTATATTTTGTGTTGTGATTATCTTTTTGTGGTGTGAATAAATCTTTTATCTTGA
ATGTAATAAGAATTTGGTGGTGTCAATTGCTTATTTGTTTTCCACGGTTGTCCAGCAA
TTAATAAAACATAACCTTTTTTACTGCCTAAAAAAAAAAAAAAAAAAAAA

Figure 6. Nucleic acid sequence of ColoUp3 (SEQ ID NO: 7)

AAAGGGGCAAGAGCTGAGCGGAACACCGGCCCGCCGTCGCGGCAGCTGCTTCACCCCTC
TCTCTGCAGCCATGGGGCTCCCTCGTGGACCTCTCGCGTCTCTCCTCCTTCTCCAGGTT
TGCTGGCTGCAGTGCGCGGCCTCCGAGCCGTGCCGGGCGGTCTTCAGGGAGGCTGAAGT
GACCTTGAGGGCGGGAGGCGCGGAGCAGGAGCCCGGCCAGGCGCTGGGGAAAGTATTCA
TGGGCTGCCCTGGGCAAGAGCCAGCTCTGTTTAGCACTGATAATGATGACTTCACTGTG
CGGAATGGCGAGACAGTCCAGGAAAGAAGGTCACCTGAAGGAAAGGAATCCATTGAAGAT
CTTCCCATCCAAACGTATCTTACGAAGACACAAGAGAGATTGGGTGGTTGCTCCAATAT
CTGTCCCTGAAAATGGCAAGGGTCCCTTCCCCCAGAGACTGAATCAGCTCAAGTCTAAT
AAAGATAGAGACACCAAGATTTTCTACAGCATCACGGGGCCGGGGGCAGACAGCCCCC
TGAGGGTGTCTTCGCTGTAGAGAAGGAGACAGGCTGGTTGTTGTTGAATAAGCCACTGG
ACCGGGAGGAGATTGCCAAGTATGAGCTCTTTGGCCACGCTGTGTGAGAGAAATGGTGCC
TCAGTGAGGACCCCATGAACATCTCCATCATCGTGACCGACCAGAATGACCACAAGCC
CAAGTTTACCCAGGACACCTTCCGAGGGAGTGTCTTAGAGGGAGTCTTACCAGGTACTT
CTGTGATGCAGGTGACAGCCACGGATGAGGATGATGCCATCTACACCTACAATGGGGTG
GTTGCTTACTCCATCCATAGCCAAGAACCAGGACCCACACGACCTCATGTTACCAT
TCACCGGAGCACAGGCACCATCAGCGTCATCTCCAGTGGCCTGGACCGGGAAAAAGTCC
CTGAGTACACACTGACCATCCAGGCCACAGACATGGATGGGGACGGCTCCACCACCACG
GCAGTGGCAGTAGTGGAGATCCTTGATGCCAATGACAATGCTCCCATGTTTGACCCCCA
GAAGTACGAGGCCCATGTGCCTGAGAATGCAGTGGGCCATGAGGTGCAGAGGCTGACGG
TCACTGATCTGGACGCCCCCAACTCACCAGCGTGGCGTGCCACCTACCTTATCATGGGC
GGTGACGACGGGGACCATTTTACCATCACCACCCACCCCTGAGAGCAACCAGGGCATCCT
GACAACCAGGAAGGGTTTGGATTTTGGAGGCCAAAAACCAGCACACCCTGTACGTTGAAG
TGACCAACGAGGCCCCCTTTTGTGCTGAAGCTCCCAACCTCCACAGCCACCATAGTGGTC
CACGTGGAGGATGTGAATGAGGCACCTGTGTTTGTCCCACCCTCCAAAGTCGTTGAGGT
CCAGGAGGGCATCCCCACTGGGGAGCCTGTGTGTGTCTACACTGCAGAAGACCCTGACA
AGGAGAATCAAAGATCAGCTACCGCATCCTGAGAGACCCAGCAGGGTGGCTAGCCATG
GACCCAGACAGTGGGCAGGTACAGCTGTGGGCACCCTCGACCGTGAGGATGAGCAGTT
TGTGAGGAACAACATCTATGAAGTCATGGTCTTGCCATGGACAATGGAAGCCCTCCCA
CCACTGGCACGGGAACCCCTTCTGCTAACACTGATTGATGTCAATGACCATGGCCCAGTC
CCTGAGCCCCGTGAGATCACCATCTGCAACCAAAGCCCTGTGCGCCAGGTGCTGAACAT
CACGGACAAGGACCTGTCTCCCCACACCTCCCTTTCCAGGCCAGCTCACAGATGACT
CAGACATCTACTGGACGGCAGAGGTCAACGAGGAAGGTGACACAGTGGTCTTGTCCCTG
AAGAAGTTCCTGAAGCAGGATACATATGACGTGCACCTTTCTCTGTCTGACCATGGCAA
CAAAGAGCAGCTGACGGTGATCAGGGCCACTGTGTGCGACTGCCATGGCCATGTGCGAAA
CCTGCCCTGGACCCTGGAAGGGAGGTTTCATCCTCCCTGTGCTGGGGGCTGTCTTGCT
CTGCTGTTCTCTCTGCTGGTGCTGCTTTTGTGTTGGTGAGAAAGAAGCGGAAGATCAAGGA
GCCCCCTCTACTCCAGAAAGATGACACCCGTGACAACGTCTTCTACTATGGCGAAGAGG
GGGGTGGCGAAGAGGACCAGGACTATGACATCACCCAGCTCCACCGAGGTCTGGAGGCC
AGGCCGGAGGTGGTTCTCCGCAATGACGTGGCACCAACCATCATCCCGACACCCATGTA
CCGTCTCTCGCCAGCCAACCCAGATGAAATCGGCAACTTTATAATTGAGAACCTGAAGG
CGGCTAACACAGACCCCCACAGCCCCGCCCTACGACACCCTCTTGGTGTTGCGACTATGAG
GGCAGCGGCTCCGACGCGCGTCCCTGAGCTCCCTCACCTCCTCCGCCTCCGACCAAGA
CCAAGATTACGATTATCTGAACGAGTGGGGCAGCCGCTTCAAGAAGCTGGCAGACATGT
ACGGTGGCGGGGAGGACGACTAGGCGGCCTGCCTGACGGGCTGGGGACCAACGTCAGG
CCACAGAGCATCTCCAAGGGGTCTCAGTTCCTCCCTTCAGCTGAGGACTTCGGAGCTTGT

CAGGAAGTGGCCGTAGCAACTTGGCGGAGACAGGCTATGAGTCTGACGTTAGAGTGGTT
GCTTCCTTAGCCTTTCAGGATGGAGGAATGTGGGCAGTTTGACTTCAGCACTGAAAACC
TCTCCACCTGGGCCAGGGTTGCCTCAGAGGCCAAGTTTCCAGAAGCCTCTTACCTGCCG
TAAAATGCTCAACCCTGTGTCCTGGGCCTGGGCCTGCTGTGACTGACCTACAGTGGACT
TTCTCTCTGGAATGGAACCTTCTTAGGCCTCCTGGTGCAACTTAATTTTTTTTTTTAAT
GCTATCTTCAAAACGTTAGAGAAAGTTCTTCAAAAGTGCAGCCCAGAGCTGCTGGGCCC
ACTGGCCGTCCTGCATTTCTGGTTTCCAGACCCCAATGCCTCCCATTTCGGATGGATCTC
TGCGTTTTTATACTGAGTGTGCCTAGGTTGCCCCTTATTTTTTTATTTTCCCTGTTGCGT
TGCTATAGATGAAGGGTGAGGACAATCGTGTATATGTACTAGAACTTTTTTTATTAAAGA
AACTTTTCCCAGAAAAAAA

Figure 7. Nucleic acid sequence of ColoUp4 (SEQ ID NO: 8)

ATGAAGCACCTGAAGCGGTGGTGGTCGGCCGGCGGCCTCCTGCACCTCACCTCCT
GCTGAGCTTGGCGGGGCTCCGCGTAGACCTAGATCTTTACCTGCTGCTGCCGCCGCCA
CCCTGCTGCAGGACGAGCTGCTGTTCTTGGGCGGCCCGGCCAGCTCCGCCTACGCGCTC
AGCCCCTTCTCGGCCTCGGGAGGGTGGGGGCGCGGGGCCACTTGACCCCCAAGGGCCG
GGAGCTGGACCCTGCCGCGCCGCCGAGGGCCAGCTGCTCCGGGAGGTGCGCGCGCTCG
GGGTCCCCTTCGTCCCTCGCACCAGCGTGGATGCATGGCTGGTGCACAGCGTGGCTGCC
GGGAGCGCGGACGAGGCCACGGGCTGCTCGGCGCCGCCGCCGCTCGTCCACCGGAGG
AGCCGGCGCCAGCGTGGACGGCGGCAGCCAGGCTGTGCAGGGGGGCGGCGGGGACCCCC
GAGCGGCTCGGAGTGGCCCCCTTGGACGCCGGGAAGAGGAGAAGGCACCCGCGGAACCG
ACGGCTCAGGTGCCGGACGCTGGCGGATGTGCGAGCGAGGAGAATGGGGTACTAAGAGA
AAAGCACGAAGCTGTGGATCATAGTTCCAGCATGAGGAAAATGAAGAAAGGGTGTGAG
CCCAGAAGGAGAACTCACTTCAGCAGAATGATGATGATGAAAACAAAATAGCAGAGAAA
CCTGACTGGGAGGCAGAAAAGACCACTGAATCTAGAAATGAGAGACATCTGAATGGGAC
AGATACTTCTTTCTCTCTGGAAGACTTATTCCAGTTGCTTTTCATCACAGCCTGAAAATT
CACTGGAGGGCATCTCATTGGGAGATATTCTCTTCCAGGCAGTATCAGTGATGGCATG
AATTCTTCAGCACATTATCATGTAACTTCAGCCAGGCTATAAGTCAGGATGTGAATCT
TCATGAGGCCATCTTGCTTTGTCCCAACAATACATTTAGAAGAGATCCAACAGCAAGGA
CTTCACAGTCACAAGAACCATTCTGCAGTTAAATTCTCATAACCAATCCTGAGCAA
ACCCTTCTGGAATAATTTGACAGGATTTCTTTCACCGGTTGACAATCATATGAGGAA
TCTAACAAGCCAAGACCTACTGTATGACCTTGACATAAATATATTTGATGAGATAAACT
TAATGTCATTGGCCACAGAAGACAACCTTTGATCCAATCGATGTTTCTCAGCTTTTTTGAT
GAACCAGATTCTGATTCTGGCCTTTCTTTAGATTCAAGTCACAATAATACCTCTGTCAT
CAAGTCTAATTCCTCTCACTCTGTGTGTGATGAAGGTGCTATAGGTTATTGCACTGACC
ATGAATCTAGTTCCCATCATGACTTAGAAGGTGCTGTAGGTGGCTACTACCCAGAACCC
AGTAAGCTTTGTCACTTGGATCAAAGTGATTCTGATTTCCATGGAGATCTTACATTTCA
ACACGTATTTTATAACCACTTACCCTTACAGCCAACCTGCACCAGAATCTACTTCTG
AACCTTTTCCGTGGCCTGGGAAGTCACAGAAGATAAGGAGTAGATACCTTGAAGACACA
GATAGAACTTGAGCCGTGATGAACAGCGTGCTAAAGCTTTGCATATCCCTTTTTCTGT
AGATGAAATTGTGCGCATGCCTGTTGATTCTTTCAATAGCATGTTAAGTAGATATTATC
TGACAGACCTACAAGTCTCACTTATCCGTGACATCAGACGAAGAGGGAAAAATAAGTT
GCTGCGCAGAACTGTGTAACGCAAATTGGACATAATTTTGAATTTAGAAGATGATGT
ATGTAACCTTGCAAGCAAAGAAGGAACTCTTAAGAGAGAGCAAGCACAATGTAACAAAG
CTATTAACATAATGAAACAGAACTGCATGACCTTTATCATGATATTTTTAGTAGATTA
AGAGATGACCAAGGTAGGCCAGTCAATCCCAACCACTATGCTCTCCAGTGTACCCATGA
TGGAAGTATCTTGATAGTACCCAAAGAACTGGTGGCCTCAGGCCACAAAAGGAAACCC
AAAAGGGAAAGAGAAAGTGAGAAAGAACTGAAGATGGACTCTATTATGTGAAGTAGTAA
TGTTTCAGAACTGATTATTTGGATCAGAAACCATTGAAACTGCTTCAAGAATTGTATCT
TTAAGTACTGCTACTTGAATAACTCAGTTAACGCTGTTTTGAAGCTTACATGGACAAAT
GTTTAGGACTTCAAGATCACACTTGTGGGCAATCTGGGGGAGCCACAACCTTTTCATGAA
GTGCATTGTATACAAAATTCATAGTTATGTCCAAAGAATAGGTTAACATGAAAACCCAG
TAAGACTTTCCATCTTGGCAGCCATCCTTTTTTAAGAGTAAGTTGGTTACTTCAAAAAGA
GCAAACACTGGGGATCAAATTATTTTAAGAGGTATTTTCAAGTTTAAATGCAAATAGCC
TTATTTTCATTTAGTTTGTAGCACTATAGTGAGCTTTTCAAACACTATTTTAATCTTT
ATATTTAACTTATAAATTTTGCTTTCTATGGAAATAAATTTTGTATTTGTATTAAAAA
AAAAAA

Figure 8. Nucleic acid sequence of ColoUp5 (SEQ ID NO: 9)

ATGAAGTTGGAGGTGTTTCGTCCCTCGCGCGGCCACGGGGACAAGCAGGGCAGTGACCT
GGAGGGCGCGGGCGGCAGCGACGCGCCGTCCCCGCTGTCGGCGGCGGGAGACGACTCCC
TGGGCTCAGATGGGACTGCGCGGCCAAGCCGTCCGCGGGCGGCGGCCAGAGATACG
CAGGGCGACGGCGAACAGAGTGCGGGAGGCGGGCCGGGCGCGGAGGAGGCGATCCCGGC
AGCAGCTGCTGCAGCGGTGGTGGCGGAGGGCGCGGAGGCCGGGGCGGCGGGGCCAGGCG
CGGGCGGCGCGGGGAGCGGCGAGGGTGACGCGAGCAAGCCATATACGCGGCGGCCCAAG
CCCCCTACTCGTACATCGCGCTCATCGCCATGGCCATCCGCGACTCGGCGGGCGGGCG
CTTGACGCTGGCGGAGATCAACGAGTACCTCATGGGCAAGTTCCCCTTTTTTCGCGGCA
GCTACACGGGCTGGCGCAACTCCGTGCGCCACAACCTTTCGCTCAACGACTGCTTCGTC
AAGGTGCTGCGCGACCCCTCGCGGCCCTGGGGCAAGGACAACACTACTGGATGCTCAACCC
CAACAGCGAGTACACCTTCGCCGACGGGGTCTTCCGCCGCCGCCGCAAGCGCCTCAGCC
ACCGCGCGCCGGTCCCCGCGCCCGGGCTGCGGCCCCGAGGAGGCCCGGGCCTCCCCGCC
GCCCCGCCGCCCGCGCCCCGCCCGCCCGGCTCGCCCCGCATGCGCTCGCCCCGCCGCCA
GGAGGAGCGCGCCAGCCCCGCGGGCAAGTTCTCCAGCTCCTTCGCCATCGACAGCATCC
TGCGCAAGCCCTTCCGCAGCCGTGCGCTCAGGGACACGGCCCCCGGGACGACGCTTCAG
TGGGGCGCCGCGCCCTGCCCCGCGCTGCGCGGTTCGCCGCGTCTCCCCGCGCTCCTCCCCGCGGCGCC
CTGCAGGGCCCTGCTGCGCTCTGCGCGTACGGCGCGGGCGAGCCGGCGCGGCTGGGCG
CGCGCGAGGCCGAGGTGCCACCGACCGCGCCGCCCTCCTGCTTGCACCTCTCCCGGCG
GCGGCCCCCGCCAAGCCACTCCGAGGCCCGGCGGCCGGCGGCGCGCACCTGTACTGCCC
CCTGCGGCTGCCCCGAGCCCTGCAGGCGGCCTTAGTCCGNCGTCCTGGCCCCGCACCTGT
CGTACCCGGTGGAGACGCTCCTAGCTTGA

Figure 9. Nucleic acid sequence of ColoUp6 (SEQ ID NO: 10)

GGCAGATGAAATATAAGATTCATCAACCACATTTGACAGCCCATGGCAGGTTTCCTGTT
TTCCATCGTCCCTCTGCAGGTCACAGACACACAGAGCCCAGCCGTGGCAGGCTCAGCCG
GGGTCCGGGGCTGCTAACAACGGCTACATTCTCCCCAGGGCCAAGGGAAATCCTGAG
CGCAGGCCAGGGTTGTTTGGTTTTGAGGTGTGCTGGGATGAAAGGCACCCTGGAAGTGG
AAGGTTCCGGTCATTCATTAATTAATTACATCTATAATTGAGGGTTTGTTCCTTAAGAGCG
AGTCCTTTGAAAGTACTTTTCCTTCAAACAGTGACTGCCACAAAGGCATCAGATATTAC
CACCTTCTCGGCTGCCTCAGCACAGCAAGCTTTATTCTGGGACCTGAGATCCTGTTCTG
AGCTGGCTTTCCCTTCTCCAGGCTCGCTCACCTCCCTTTAGAGATAGTGGATGGTAAG
ATGACCAATGCTCAGATTATTCTTCTCATTGACAATGCCAGGATGGCAGTGGATGACTT
CAACCTCAAGAAATGGAGAAGCATCATGTGCCAAGTGACTTCAATGTCAATGTGAAGGT
GGATACAGGTCCCAGGGAAGATCTGATTAAGGTCCTGGAGGATATGAGACAAGAATATG
AGCTTATAATAAAGAAGAAGCATCGAGACTTGGACACTTGGTATAAAGAACAGTCTGCA
GCCATGTCCCAGGAGGCAGCCAGTCCAGCCACTGTGCAGAGCAGACAAGGTGACATCCA
CGAACTGAAGCGCACATTCAGGCCCTGGAGATTGACCTGCAGGCACAGTACAGCACGA
AATCTGCTTTGGAAAACATGTTATCCGAGACCCAGTCTCGGTACTCCTGCAAGCTCCAG
GACATGCAAGAGATCATCTCCCACTATGAGGAGGAACTGACGCAGCTACGCCACGAACT
GGAGCGGCAGAACAATGAATACCAAGTGCTGCTGGGCATCAAAACCCACCTGGAGAAGG
AAATCACCACGTACCGACGGCTCCTGGAGGGAGAGAGTGAAGGGACACGGGAAGAATCA
AAGTCGAGCATGAAAGTGTCTGCAACTCCAAAGATCAAGGCCATAACCCAGGAGACCAT
CAACGGAAGATTAGTTCTTTGTCAAGTGAATGAAATCCAAAAGCACGCATGAGACCAAT
GAAAGTTTCCGCCTGTTGTAAATCTATTTTCCCCCAAGGAAAGTCCTTGCACAGACAC
CAGTGAGTGAGTTCTAAAAGATACCCTTGGAAATTATCAGACTCAGAACTTTTATTTTT
TTTTTCTGTAAACAGTCTCACCAGACTTCTCATAATGCTCTTAATATATTGCACTTTTCT
AATCAAAGTGCGAGTTTATGAGGGTAAAGCTCTACTTTCCTACTGCAGCCTTCAGATTC
TCATCATTTTGCATCTATTTTGTAGCCAATAAACTCCGCACTAGCAAAAAAAAAAAAA

Figure 10. Nucleic acid sequence of ColoUp7 (SEQ ID NO: 11)

TTTTTTTTTTAAAAAAGAGGCTTGGTAAGTTTTTGATGCTTAGTTGACTTTTAGCATT
ATCCAGCATTTGTATTATGAACCAGTGAGTACTGTAATTTTTCTTTCCCTTTCAGAAAG
ACTCAAAGGGAACATATAAATGTTTCCTATTTTAAATGTGGCAATAGTGTAGCTAACAC
TGGTACAGACGGAATAAACACACCTCTAATATTCTCCTGAAGATTTGGTGATCCAGTTT
CAAATAAGGTATGGGAAAAACAGATGTTTTCAATTATCGCCACTTAATCCTTACTTCCGA
TTATAATTATACATGTTTGGCTGTAATAACTATACTAAAGCATGCTTGTGAAAGTAGAC
TTCTACAAGGACAGAAAACCCACAACAACAAAGATCGATCACGAAAGACAAGGCATA

Figure 11. Nucleic acid sequence of ColoUp8 (SEQ ID NO: 12)

CTTTTCTTCCGCACGGTTGGAGGAGGTCGGCTGGTTATCGGGAGTTGGAGGGCTGAGGT
CGGGAGGGTGGTGTGTACAGAGCTCTAGGACTCACGCACCAGGCCAGTCGCGGATTTTG
GGCCGAGGCCTGGGTTACAAGCAGCAAGTGCGCGGTTGGGGCCACTGCGAGGCCGTTTT
AGAAAACCTGTTTAAAACAAAGAGCAATTGATGGATAAATCAGGAATAGATTCTCTTGAC
CATGTGACATCTGATGCTGTGGAACCTTGCAAATCGAAGTGATAACTCTTCTGATAGCAG
CTTATTTTAAAACCTCAGTGTATCCCTTACTCACCTAAAGGGGAGAAAAGAAACCCCATTC
GAAAATTTGTTTCGTACACCTGAAAGTGTTACGCAAGTGATTATCAAGTGACTCATCT
TTTGAACCAATACCATTGACTATAAAAGCTATTTTTTGAAGATTCAAGAACAGGAAAAA
GAGATATAAAAAAAGAAAAAGAGGAGGTACCAGCCAACAGGAAGACCACGGGGAAGAC
CAGAAGGAAGGAGAAATCCTATATACTCACTAATAGATAAGAAGAAACAATTTAGAAGC
AGAGGATCTGGCTTCCCATTTTTTAGAATCAGAGAATGAAAAAACGCACCTTGGAGAAA
AATTTTAAACGTTTGAGCAAGCTGTTGCAAGAGGATTTTTTAACTATATTGAAAAGCTGA
AGTATGAACACCACCTGAAAGAATCATTGAAGCAAATGAATGTTGGTGAAGATTTAGAA
AATGAAGATTTTGACAGTCGTAGATACAAATTTTTTGGATGATGATGGATCCATTTCTCC
TATTGAGGAGTCAACAGCAGAGGATGAGGATGCAACACATCTTGAAGATAACGAATGTG
ATATCAAATTTGGCAGGGGATAGTTTTCATAGTAAGTTCTGAATTCCCTGTAAGACTGAGT
GTATACTTAGAAGAAGAGGATATTACTGAAGAAGCTGCTTTGTCTAAAAAGAGAGCTAC
AAAAGCCAAAAATACTGGACAGAGAGGCCTGAAAATGTGACAGGATCATGAATGTCAA
GGCTTTTATCTTGAGAACATGGTGTCTGGAGTTAAAGGTATTGGCATACTCCACACATC
TGTACCATTCTTGAGTGATCGCTTAGGAATGAATGTGATTTGAACTCATTCATGTTGAG
AGGGTGTCAAATTGAGAACCAGGTAGATCCCCACCACCTACAGTAAAAAGGACCCTAAA
GTAAATTGGTTGAAGAAATTAGATCCCAAAGATTCTTGGTGAATTTTGAAGTCTTCATC
AGTATATCCATATTTAAACGAGATGACAGAAGCCAAAGTAATTATGGCAAGTAATGGTT
TTTATCTTAACTATAAGTTATTTGCTCAAGGGTGAATGGTCATTACCAAGGCTTTTAG
AATGCAGTTTCTCATTTGCTGTGGACATGACCATAAAAAAAATTTCCAGTAGGTTTTT
CTATCTGCTACGTTGCTAGCAATCAGCTTATTGGGAACAGTTGATTAACTGTAATAGAA
ATGCAATACAAATAAAATGTGAACCACATGTGATTTTTCTTTAAAATCAGTGAGATTTG
AAAATTTCTCCTAGATCTCTTGAATCATGCAAATTTGCTTTGCCTTTATATTGTAACCTT
TGTGGGTTGCTAATAACCAAGCAGTTTGTAGTAGAGTTAACTCAGGCTCGTTCTAGGGA
CTCATTCATGTTCACTCACTGTACACTCATCTCTGGAAATGTAAAATTTACTTTTATAC
TATTGTTATGTAGGGCTGACAGGACAACTGGATCAGTTTCATTAAAAAGGTATGTATGC
ATTAGAAAAGACATTTGTATGGGTCATTTCAAAGAGGGCTTATGAGGCTGTGAAACCCA
GAGCTCTTAACGCTGTGACCAAAGATGGAAGTTCTCTATAGGAAGCCATAGCACTCCTA
ATGTTTGGTGCTATGTTTTCTGAGGAGATATAAAACGTAATAATCCATGATTGTTGCC
ATGTGAGAGTTTTAAAGGTTAATCAAATTTCTCTTCTTCAGGGCAAACCTTGAAGATAA
ATCTTTTGACTCCAGCTCTTTAGAGGATCTAAAGTGACCTTGATGGACAGTGGAAGAAA
TCACAACATGGAATTCCTCGAATAACAATTTATTGACTTTAAATAATTTTGTCTAATGC
TACATATACACAATTAAAAACCTTTACACTATTTCTAGAAAGTCAGCATGTATTTTTG
GCTCGAAGTTTCTCTAGTGTTTTCTGTGGAAGGAATAAAAAATTTGAGTTTCAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

Figure 12. Amino acid sequence of full-length ColoUp1 protein (SEQ ID NO: 13)

MGAAGRQDFLFAKMLTISWLTLTCTCPGATSTVAAGCPDQSPQLPWNPGHDQDHHVHIG
QGKTLTLLTSSATVYSIHISEGGKLVIKDHDEPIVLRTRHILIDNGGELHAGSALCPFQG
NFTIILYGRADEGIQPDPIYGLKYIGVGKGALELHGQKKLSWTFNLKTLHPGGMAEGG
YFFERSWGHARGVIVHVIDPKSGTVIHSDFDTYRSKKESERLVQYLNAVDPGRILSVAV
NDEGSRNLDDMARKAMTKLGSKHFLHLGFRHPWSFLTVMKGNPSSSVEDHIEYHGHRGSA
AARVFKLFQTEHGEYFNVSLSSSEWVQDVEWTEWFDHDKVSQTKGGEKISDLWKAHPGKI
CNRPIDIQATTMDGVNLSTEVVYKKGQDYRFACYDRGRACRSYRVRFLCGKPVPRPKLTV
TIDTNVNSTILNLEDNVQSWKPGDTLVIASDTDSMYQAEFFQVLPCRSCAPNQVKVAGK
PMLHIGEEIDGVDMRAEVGLLSRNIIVMGEMEDKCYPYRNHICNFFDFDTFGGHIKFA
LGFKAAHLEGTELKHMGGQLVGQYPIHFHLAGDVDERGGYDPPTYIRDLSIHHTFSRCV
TVHGSGNLLIKDVVGYNLSLGHCFETEDGPEERNTFDHCLGLLVKSGTLLPSDRDSKMCK
MITEDSYPGYIPKPRQDCNAVSTFWMANPNNNLINCAAAGSEETGFWFIFHHVPTGPSV
GMYSPPGYSEHIFLGKFYNNRAHSNYRAGMIIDNGVKTTEASAKDKRPFLSIISARYSPH
QDADPLKPREPAIIRHFIAYKNQDHGAWLRGGDVWLDSCRADNGIGLTLASGGTFFPYD
DGSKQEIKNSLFVGESGNVGTEMDNRIWGPGLDHSGRTPIGQNFPPIRGIQLYDGPI
NIQNCTFRKFVALEGRHTSALAFLNNAWQSCPHNNVTGIAFEDVPITSRVFFGEPGPW
FNQLDMDGDKTSVFHDVDGSVSEYPGSYLTKNDNWLVRHPDCINVPDWRGAICSGCYAQ
MYIQAYKTSNLRMKIINKDFPSHPLYLEGALTRSTHYQQYQPVVTLQKGYTIHWDQTAP
AELAIWLINFNKGDWIRVGLCYPRGTTFSILSDVHNRLKQTSKGTGVFVRTLQMDKVEQ
SYPRSHYYWDEDSGLLFLKLKAQNEREKFAFCSMKGCERIKIKALIPKNAGVSDCTAT
AYPKFTERAVVDVPMPPKLFQSGLKTKDHFLEVKMESKQHFFHLWNDFAYIEVDGKKY
PSSDGIQVVVIDGNQGRVVSHTSFRNSILQGIWQLFNIVATIPDNSIVLMASKGRYV
SRGPWTRVLEKLGA DRGLKLKEQMAFVGFKGSFRPIWVTLDTEDHKAKIFQVVPVVK
KKKL

Figure 13. Amino acid sequence of full-length ColoUp2 protein (SEQ ID NO: 14)

MPPFLLLEAVCVFLFSRVPPSLPLQEVHVSKETIGKISAASKMMWCSAAVDIMFLLDGS
NSVGKGSFERSKHFAITVCDGLDISPERVRVGAFQFSSTPHLEFPLDSFSTQQEVKARI
KRMVFKGGRTETELALKYLLHRGLPGGRNASVPQILIIVTDGKSQGDVALPSKQLKERG
VTVFAVGVRFPFPRWHEELHALASEPRGQHVLLAEQVEDATNGLFSTLSSSAICSSATPDCR
VEAHPCEHRTLEMVREFAGNAPCWGRSRRTLAVLAAHCPFYSWKRVFLTHPATCYRTTC
PGPCDSQPCQNGGTCVPEGLDGYQCLCPLAFGGEANCALKLSLECRVDLLFLLDSSAGT
TLDGFLRAKV FVKRFVRAVLSEDSRARVGVATYSRELLVAVPVGEYQDVPDLVWSLDGI
PFRGGPTLTGSALRQAAERGFGSATRTGQDRPRRVVLLTESHSEDEVAGPARHARARE
LLLLGVGSEAVRAELEEEITGSPKHVMVYSDPQDLFNQIPELQGKLCSRQRP GCRTQALD
LVFMLDTSASVGPENFAQM QS FVRSCALQFEVNP DVTQVGLVVYGSQVQTAFGLDTKPT
RAAMLRAISQAPYLGGVGSAGTALLHIYDKVMTVQRGARPGV PKAVVLTGGRGAEDAA
VPAQKL RNNGISVLVVGVPVLSEGLRRLAGPRDSL IHVAAYADLRYHQDV LIEWLCGE
AKQPVNLCKPSPCMNEGSCVLQNGSYRCKCRD GWEGPHCENRFLRRP

Figure 14. Amino acid sequence of full-length Osteopontin protein (SEQ ID NO: 15)

MRIAVICFCLLGITCAIPVKQADSGSSEEKQLYNKYPDVATWLNPDPSQKQNLLAPQT
LPSKSNESHDMDDMDEDDDDHVDSQDSIDSNDSDDVDDTDDSHQSDSHHSDSEDEL
VTDFPTDLPATEVFTPVVPTVDITYDGRGDSVVYGLRSKSKKFRRPDIQYPDATDEDITS
HMESEELNGAYKAIPVAQDLNAPSDWDSRGKDSYETSQLDDQSAETHSHKQSRLYKRKA
NDESNEHSDVIDSQELSKVSREFHSHEFHSHEDMLVVDPKSKEEDKHLKFRISHELDSA
SSEVN

Figure 15. Amino acid sequence of full-length ColoUp3 protein (SEQ ID NO: 16)

MGLPRGPLASLLLLQVCWLQCAASEPCRAVFREA EVTLEAGGAEQEPGQALGKVFMGCP
GQEPALFSTDND DFTVRNGETVQERRSLKERNPLKIFPSKRILRRHKRDWV VAPISVPE
NGKGPFPQRLNQLKSNKDRDTKIFYSITGPGADSPPEGVFAVEKETGWLLL NKPLDREE
IAKYELFGHAVSENGASVEDPMNISII VTDQNDHKPKFTQDTFRGSVLEGVLPGTSVMQ
VTATDEDDAIYTYNGVVAYS IHSQEPKDPHDL MFTIHRSTGTISVISSGLDREKVPEYT
LTIQATDMDGDGSTTTAVAVVEILDANDNAPMFD PQKYEAHVPENAVGHEVQRLTVTDL
DAPNSPAWRATY LIMGGDDGDHFTITTHPESNQGIL TTRKGLDFEAKNQHTLYVEVTNE
APFVLKLPTSTATIVVHVEDVNEAPVFVPPSKVVEVQEGIPTGEPVCVYTAEDPDKENQ
KISYRILRDPAGWLAMD PDSGQVTAVGTL DREDEQFVRNNIYEVMLAMDNGSPPTTGT
GTLLLT LIDVNDHGPVPEPRQITICNQSPVRQVLNITDKDLS PHTSPFQAQLTDDSDIY
WTAEVNEEGDTVVL SLKKFLKQD TYDVHLSLS DHGNEQLTVIRATVCDCHGHVETCPG
PWKGGF ILPVLGAVLALLFLLL VLLLLVRKKRKIKEPLLL PEDDTRDNV FYYGEEGGGE
EDQDYDITQLHRGLEARPEVVL RNDVAPTIIPTPMYRPRPANPDEIGNFIIENLKAANT
DPTAPPYDTLLVFDYEGSGSDAASLSSLTSSASDQDQDYDYLNEWGSRFKKLADMYGGG
EDD

Figure 16. Amino acid sequence of full-length ColoUp4 protein (SEQ ID NO: 17)

MKHLKRWSAGGGLLHLTLLLSLAGLRVDLDLYLLLPPPTLLQDELLFLGGPASSAYAL
SPFSASGGWGRAGHLHPKGRELDPAAPPEGQLLREVRALGVFPVPRTSVDAWLVHSVAA
GSADEAHGLLGAAAASSTGGAGASVDGGSQAVQGGGDPRAARSGPLDAGEEEKAPAEP
TAQVPDAGGCASEENGVLREKHEAVDHSSQHEENEERVSAQKENSLLQNDNDDENKIAEK
PDWEAEKTTESRNERHLNGTDTFSLEDLFQLLSSQPENSLEGISLGDIPLPGSISDGM
NSSAHYHVNFSQAI SQDVNLHEAILLCPNNTFRDPTARTSQSQEPFLQLNSHTTNPEQ
TLPGTNLTGFLSPVDNHRNLT SQDLLYDL DINFDEINLMSLATEDNFDPIDVSQ LFD
EPDSDSGLSLDSSHNTSVIKSNSSH SVCDEGAIGYCTDHESSSHHDLEGAVGGYYPEP
SKLCHLDQSDSDFHGD LTFQHVFHNHTYHLQPTAPESTSEPFWPWPKSQKIRSRYLEDT
DRNLSRDEQRAKALHIPFSVDEIVGMPVDSFNSMLSRYYLTDLQVSLIRDIRRGKKNKV
AAQNCRKRKLDIILNLEDDVCNLQAKKETL KREQAQC NKAINIMKQKLHDLYHDIFSRLL
RDDQGRPVNPNHYALQCTHDGSILIVPKELVASGHKKETQKGKRK

Figure 17. Amino acid sequence of full-length ColoUp5 protein (SEQ ID NO: 18)

MKLEVFVPRAAHGDKQGS DLEGAGGSDAPSPLSAAGDDSLGSDGDCAAKPSAGGGARDT
QGDGEQSAGGGPGAEEAIPAAAAA VVAEGAEAGAAGPGAGGAGSGEGARSKPYTRRPK
PPYSYIALIAMAIRDSAGGRLTLAEINEYLMGKFPFFRGSYTGWRNSVRHNLSLND CFV
KVL RDPSRPWGKDNYWMLNPNSEYTFADGVFRRRRKRLSHRAPVPAPGLRPEEAPGLPA
APPPAPAAPASPRMRSPARQEERASPAGKFSSSFAIDSILRKPFRRRLRDTAPGTTLQ
WGAAPCPPLPAFPALLPAAPCRALLPLCAYGAGEPARLGAREAEVPPTAPPLLLAPLPA
AAPAKPLRGPAAGGAHLYCPLRLPAALQAALVRRPGPHLSYPVETLLA

Figure 18. Amino acid sequence of full-length ColoUp6 protein (SEQ ID NO: 19)

MEKHHVPSDFNVNVKVDTPREDLIKVLEDMRQEYELIIKKKHRDLDTWYKEQSAAMSQ
EAASPATVQSRQGDIELKRTFQALEIDLQAQYSTKSALENMLSETQSRYSCKLQDMQE
IISHYEEELTQLRHELERQNNYQVLLGIKTHLEKEITTYRRLLEGESEGTREESKSSM
KVSATPKIKAITQETINGRLVLCQVNEIQKHA

Figure 19. Amino acid sequence of full-length ColoUp8 protein (SEQ ID NO: 20)

MDKSGIDSLDHVTSDAVELANRSDNSSDSSLFKTQCIPIYSPKGEKRNPIRKFFVRTPEV
HASDSSSDSSFEPITIKAIKIFERFKNRKKRYKKKKKRRYQPTGRPRGRPEGRNPIYS
LIDKKKQFRSRGSGFPFLESENEKNAPWRKILTFEQAVARGFFNYIEKLKYEHLKESL
KQMNVGEDLENEFDSSRYKFLDDGSIPIEESTAEDEDATHLEDNECDIKLAGDSFI
VSSEFPVRLSVYLEEEDITEEAALSKKRATKAKNTGQRLKM

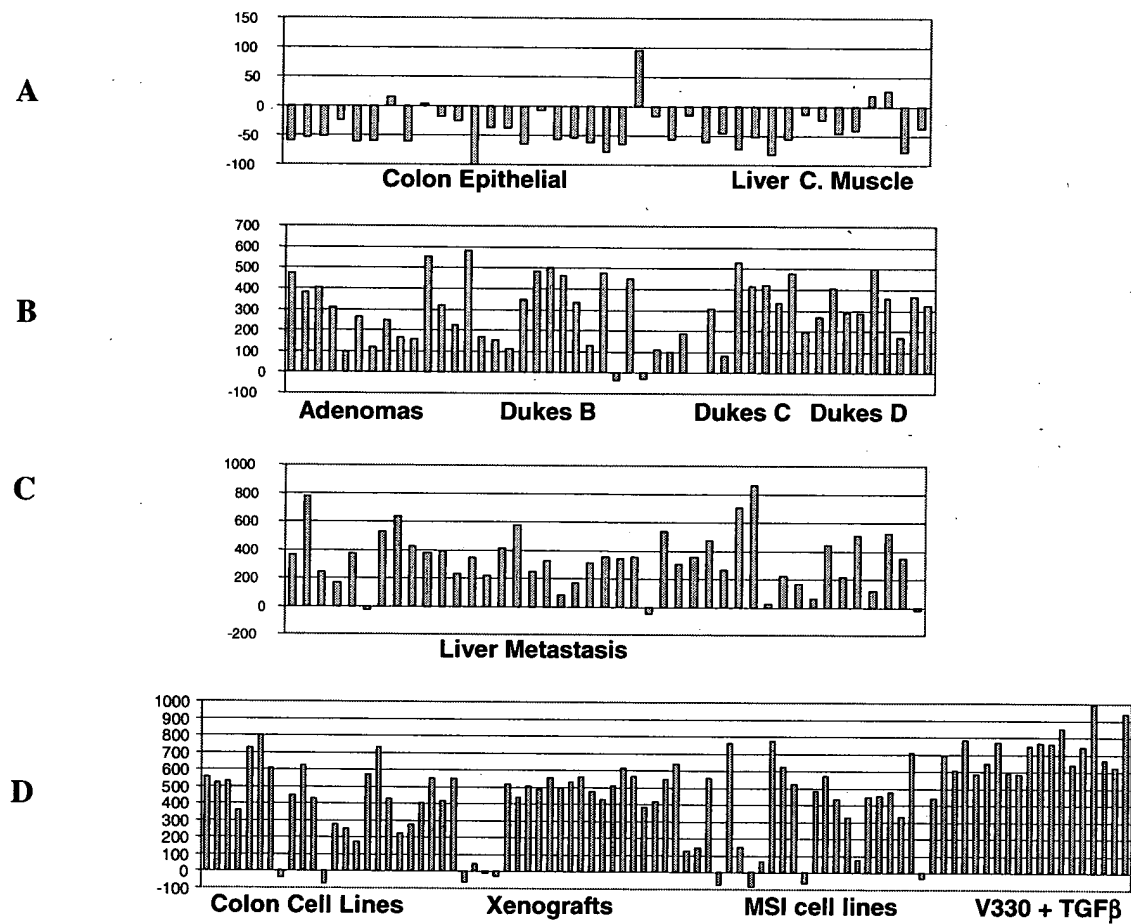


Figure 20

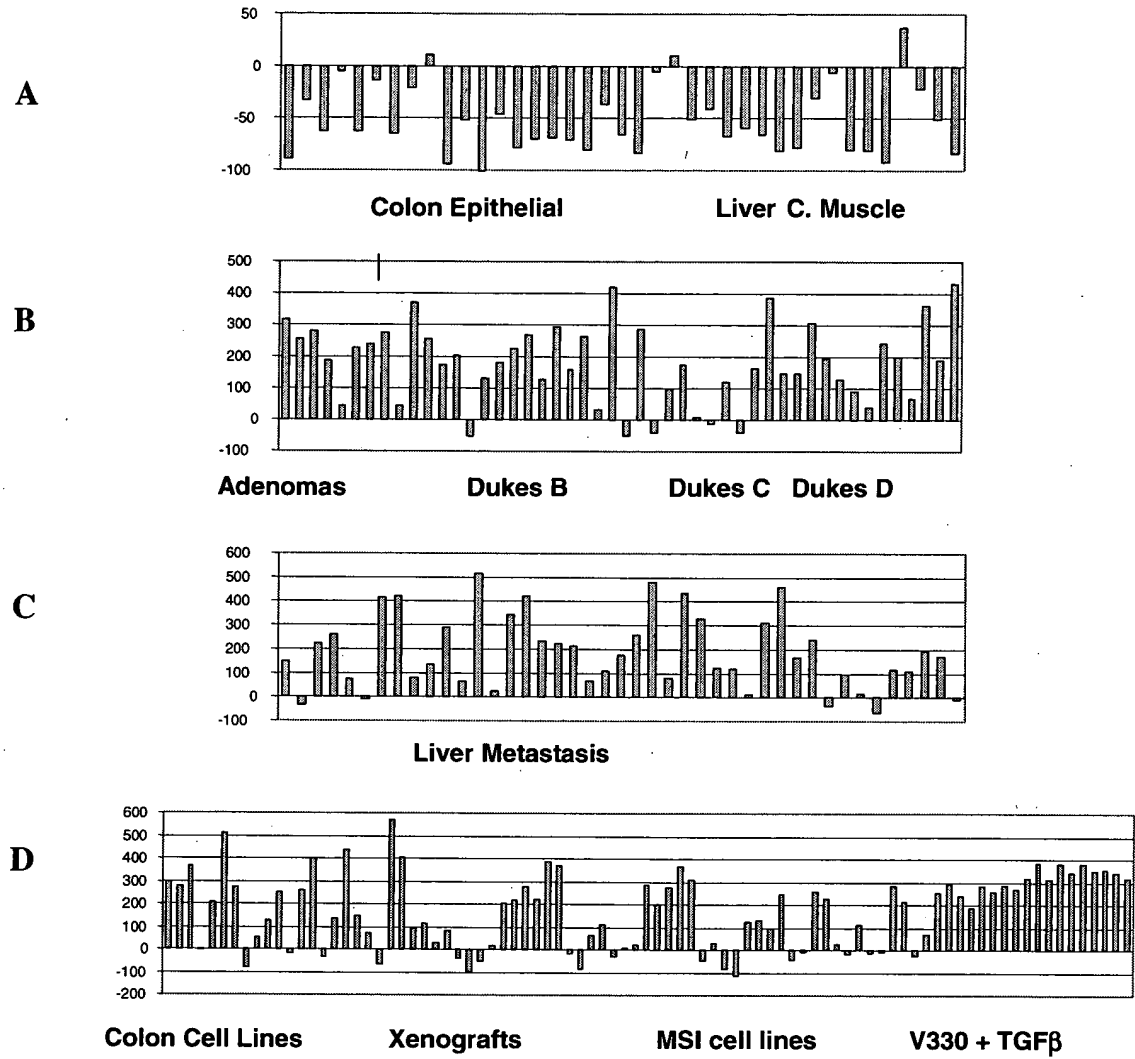


Figure 21

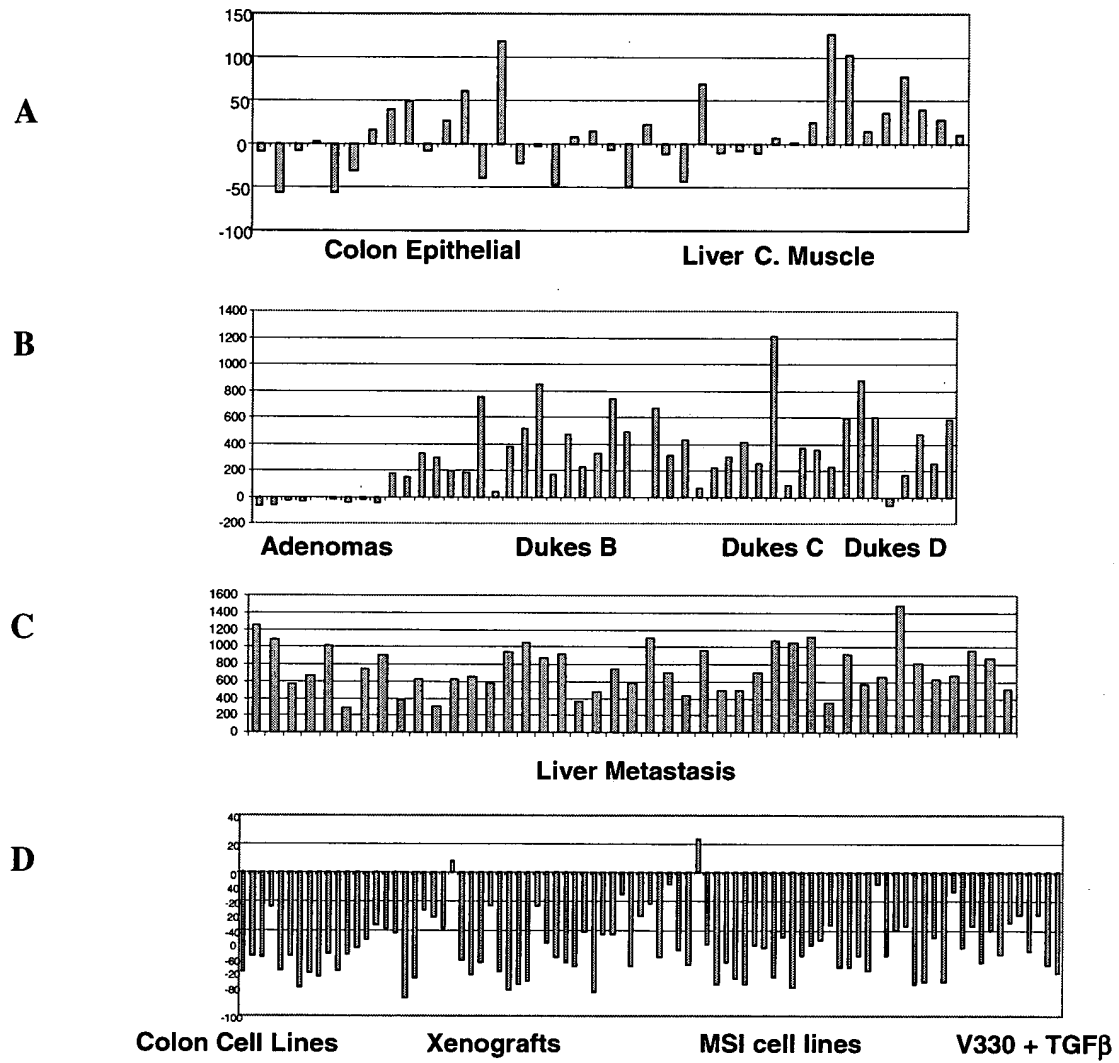


Figure 22

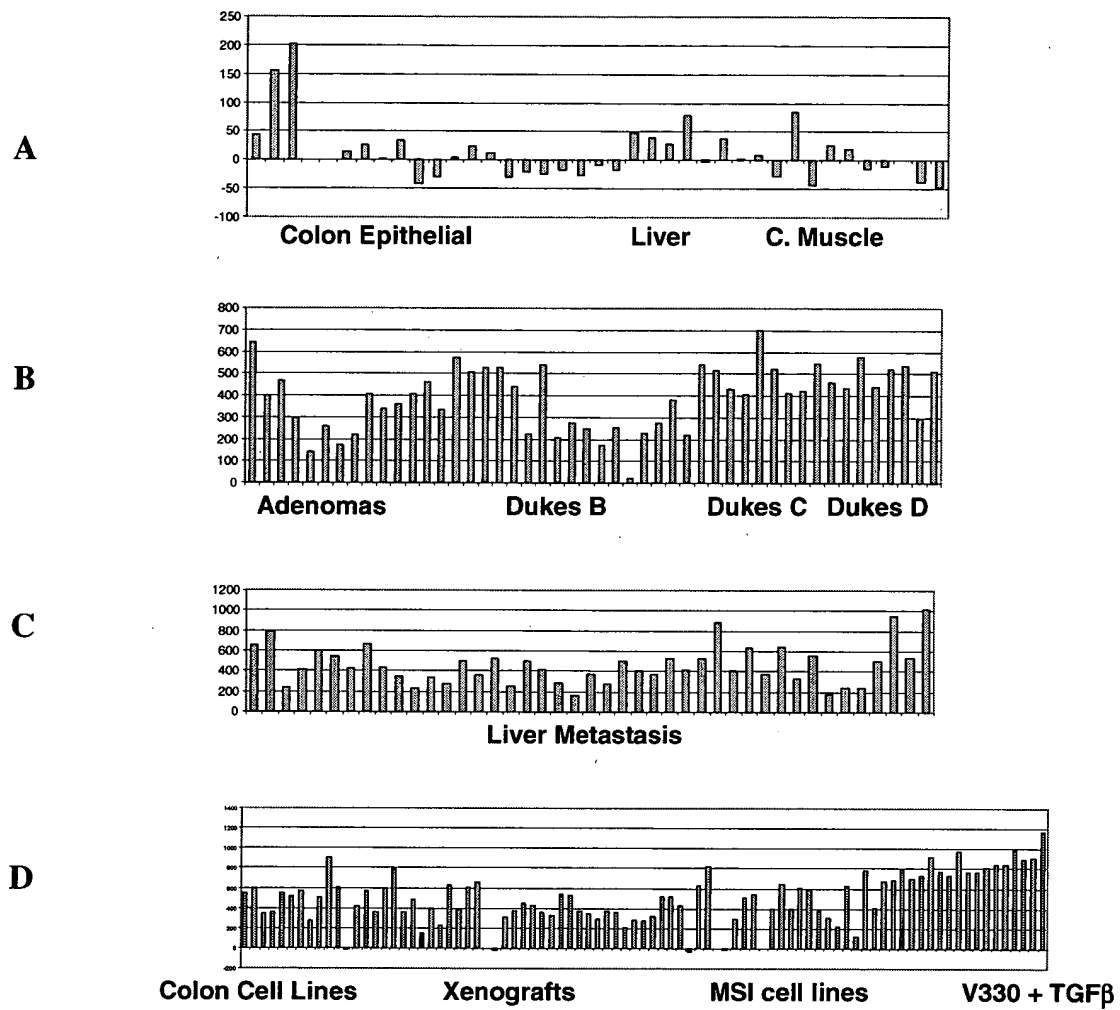


Figure 23

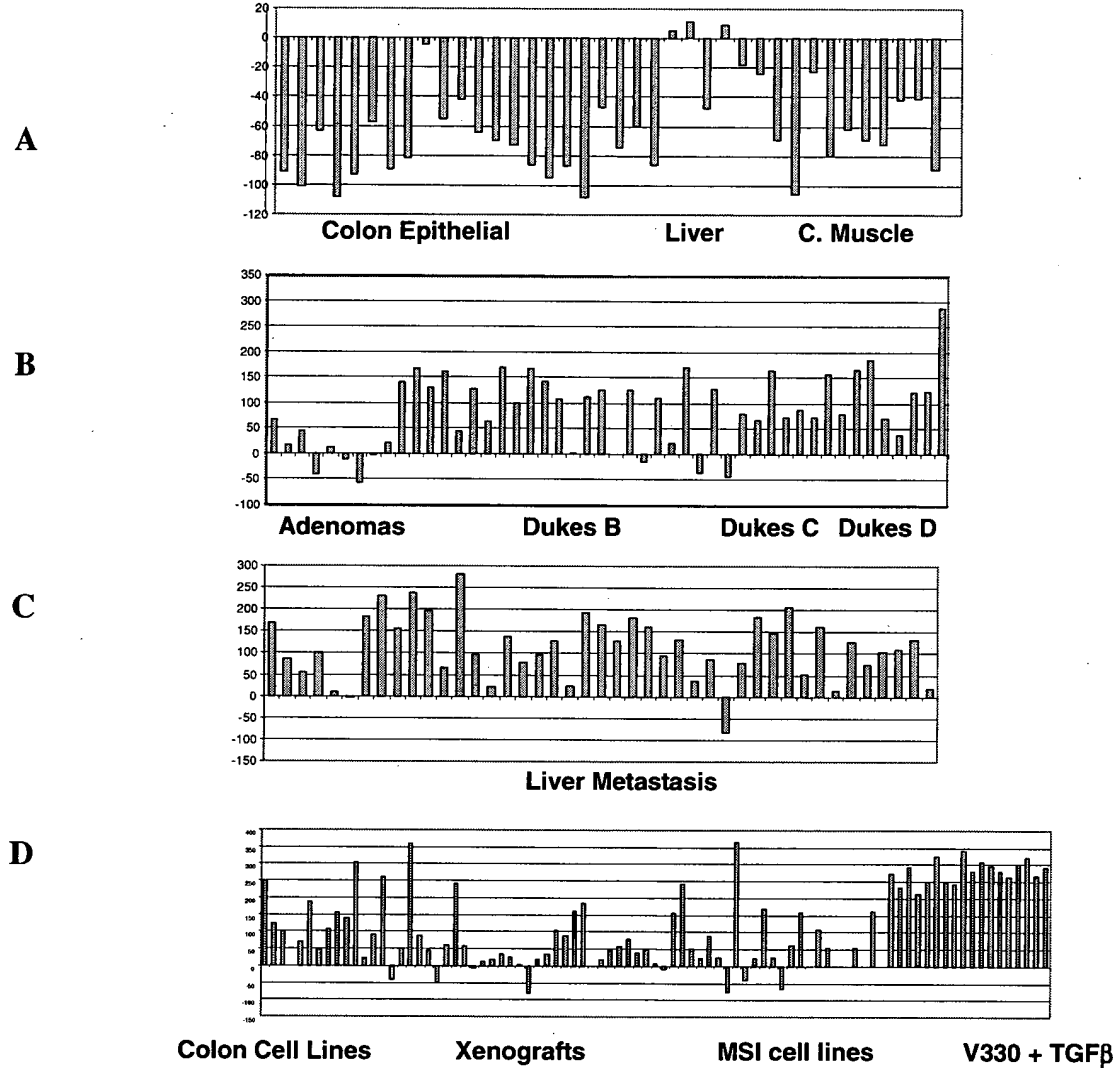


Figure 24

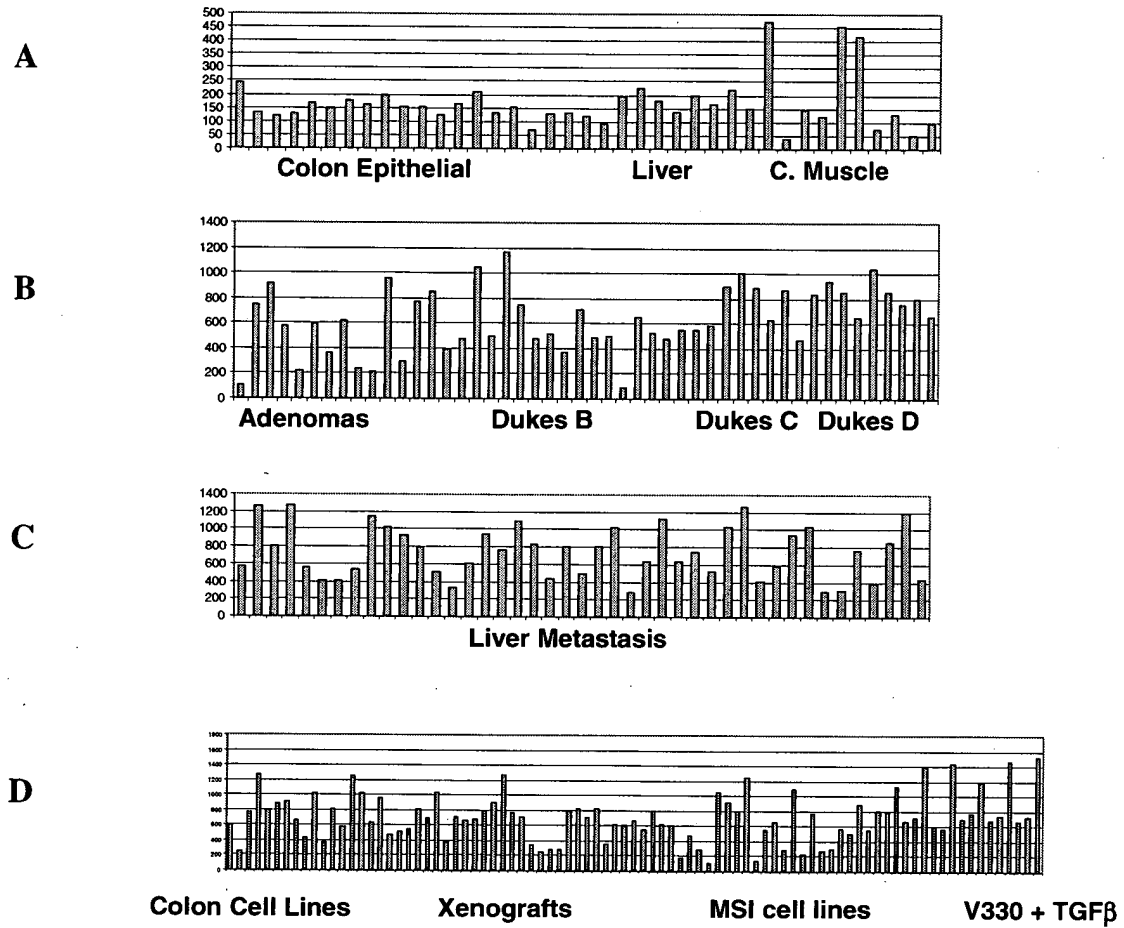


Figure 25

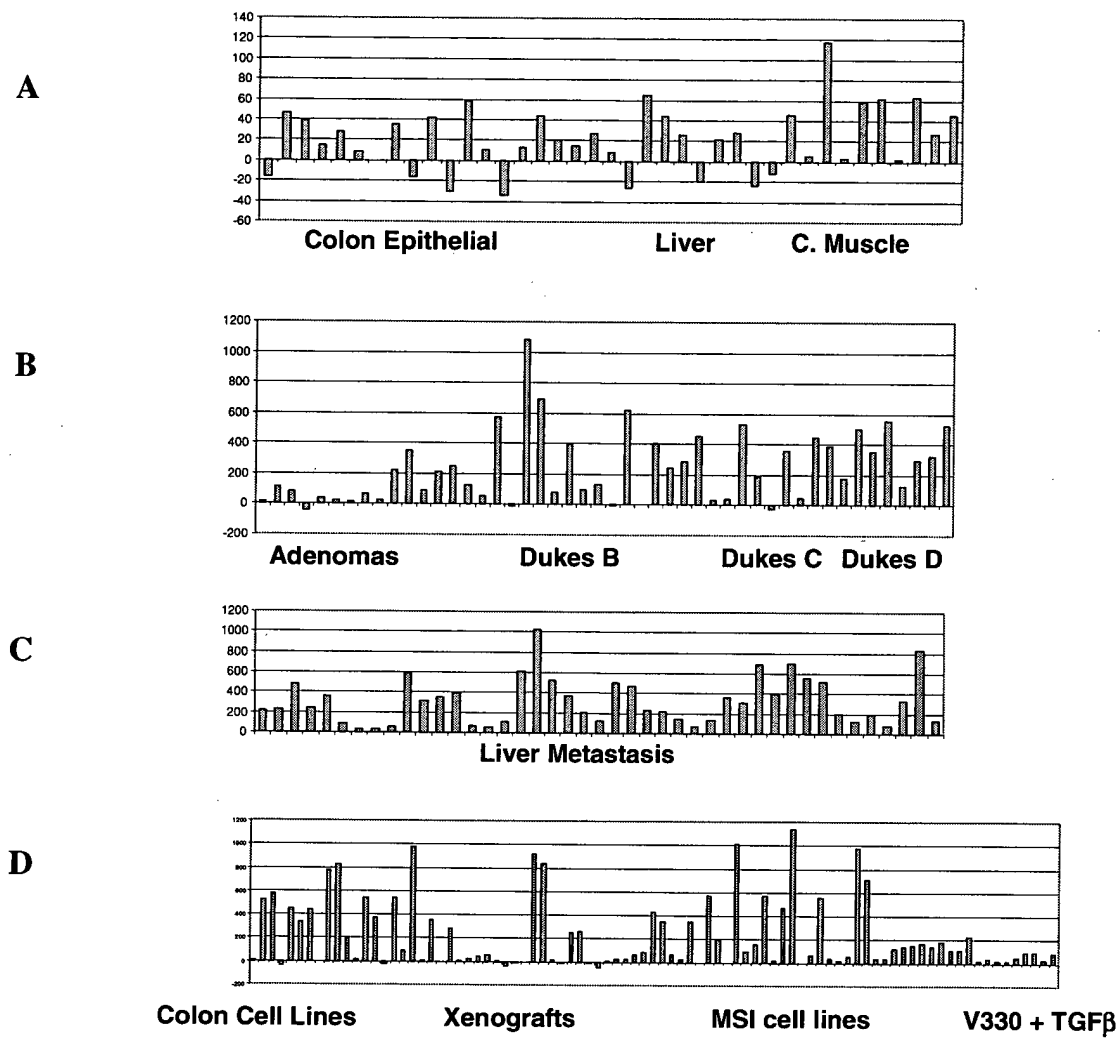


Figure 26

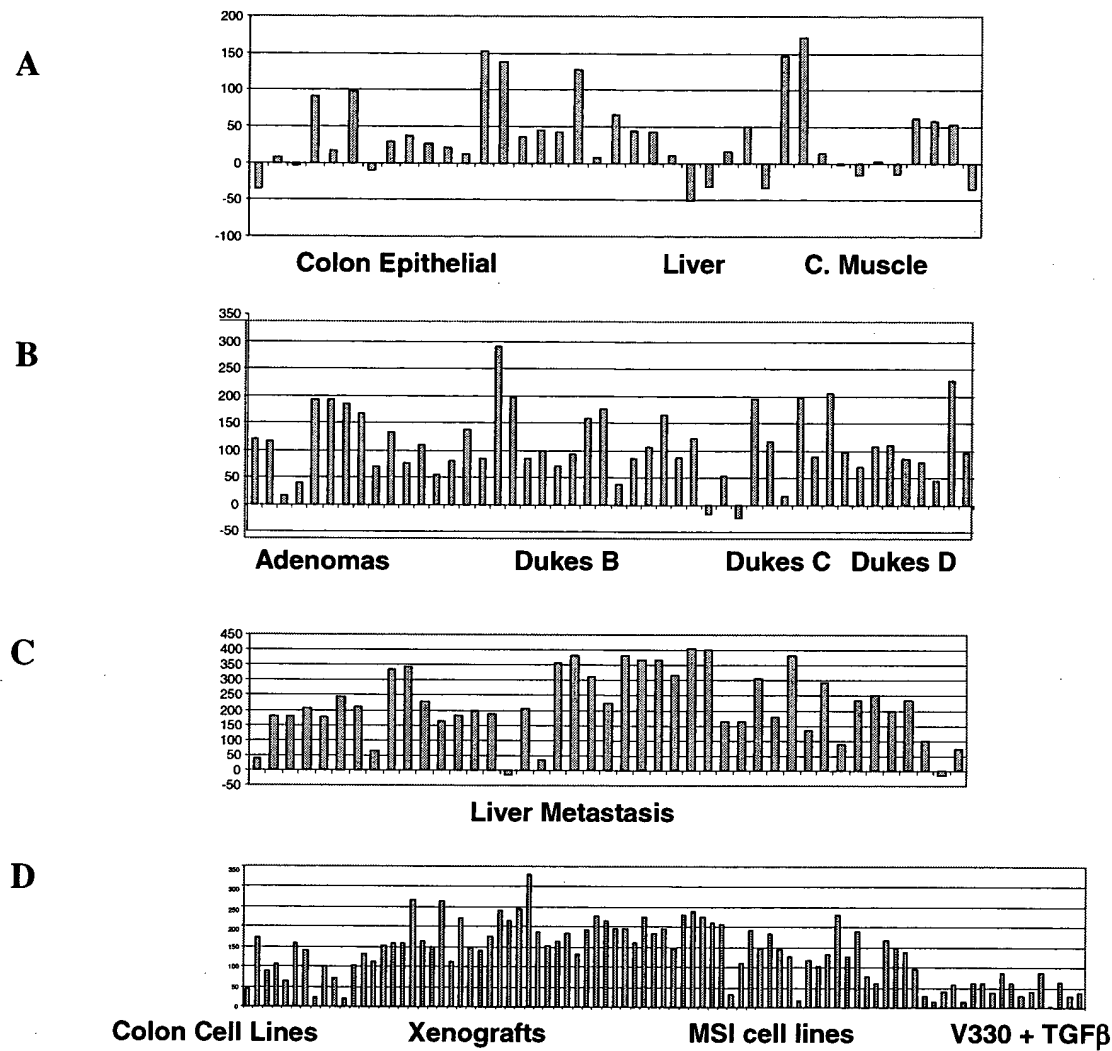
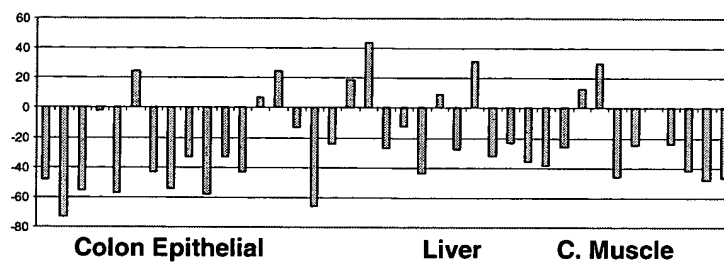
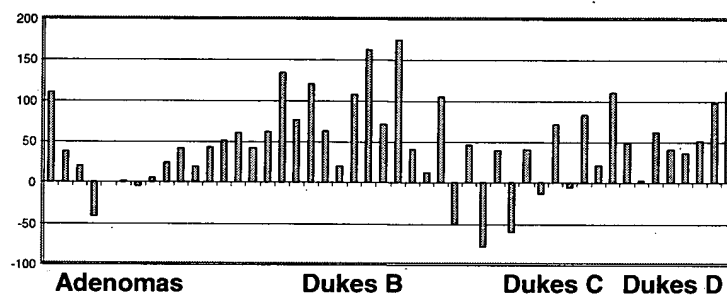


Figure 27

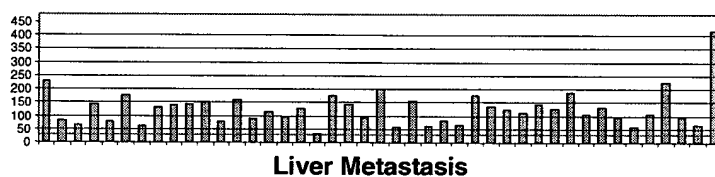
A



B



C



D

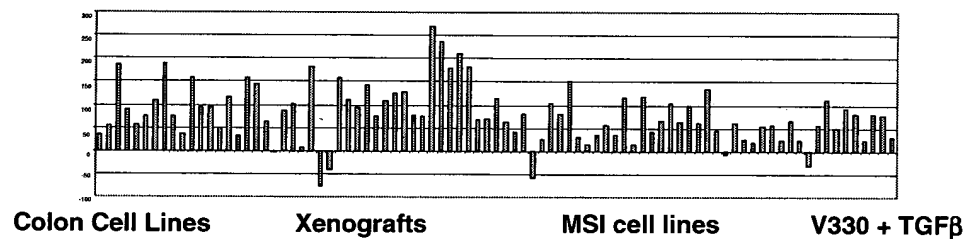


Figure 28

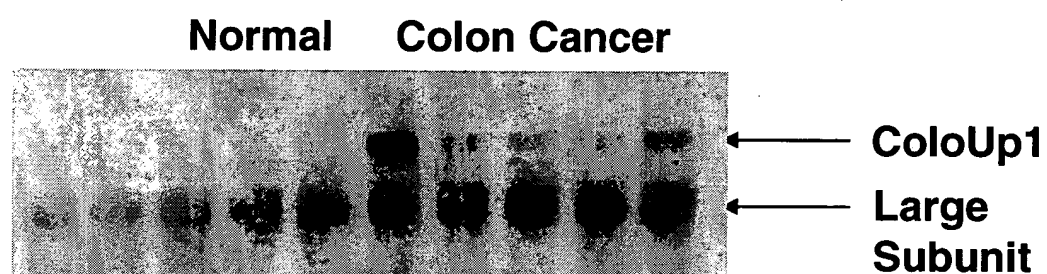


Figure 29A

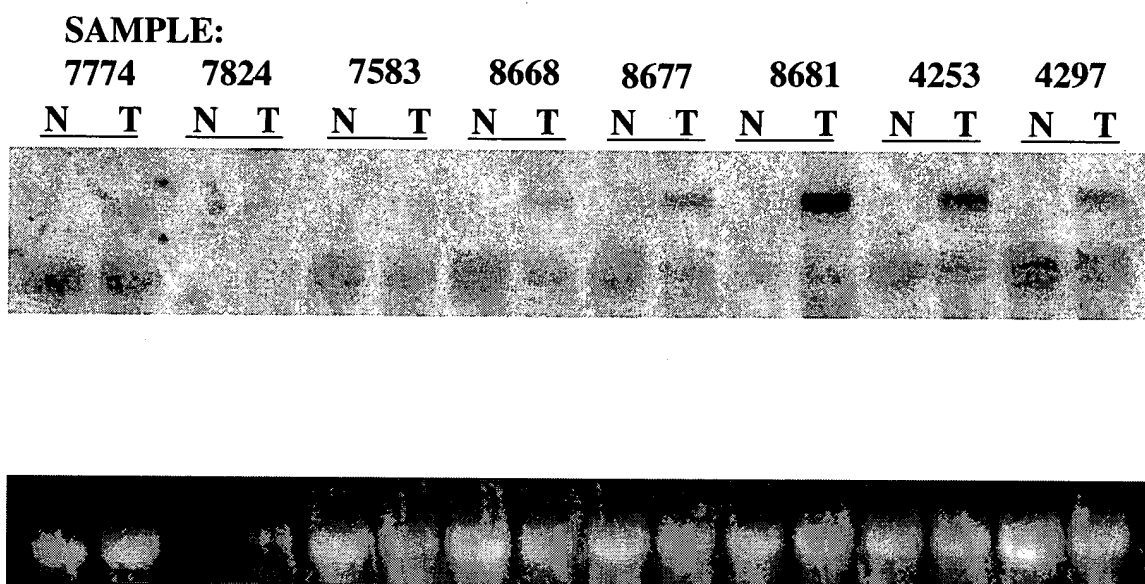


Figure 29B

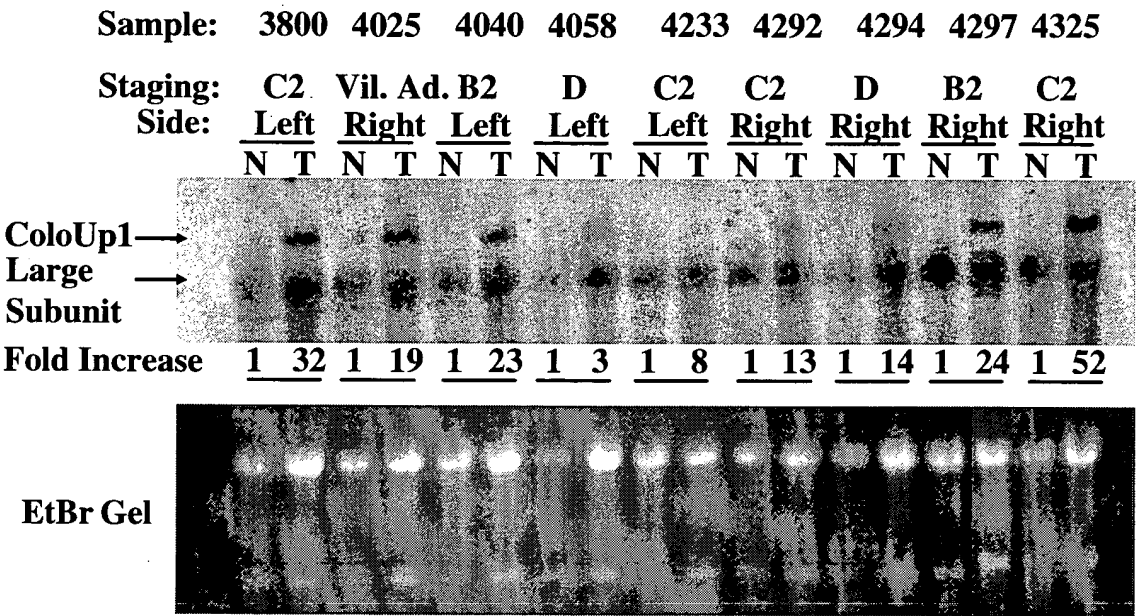


Figure 29C

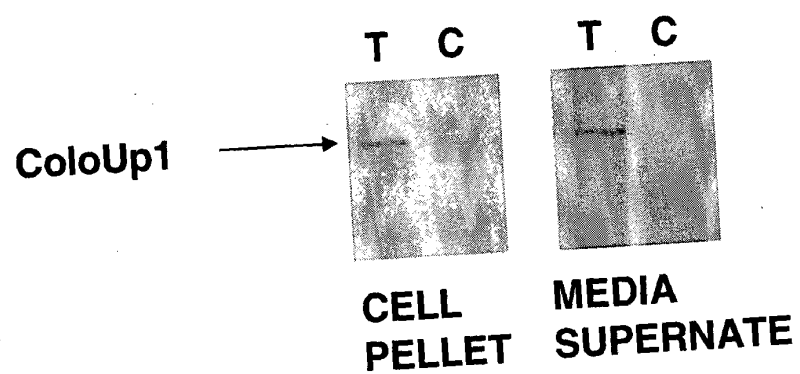


Figure 30A

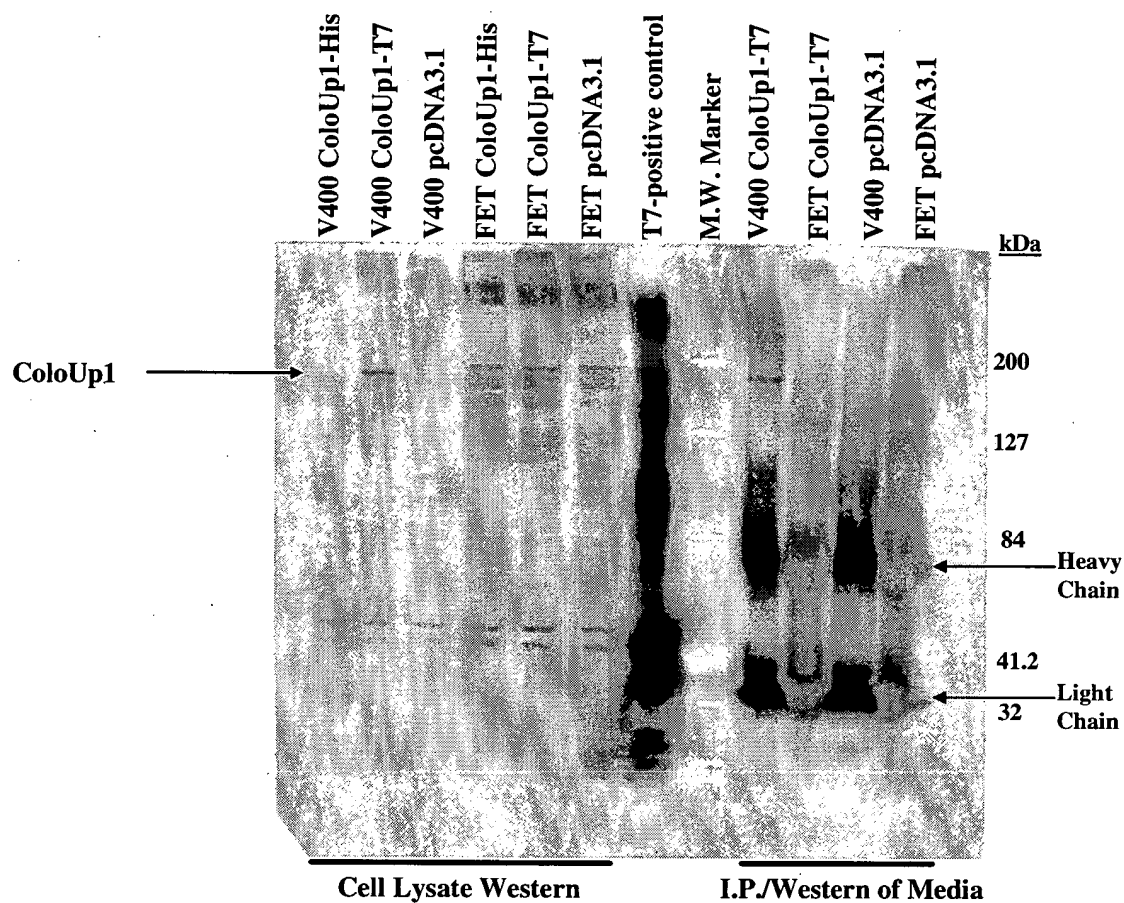


Figure 30B

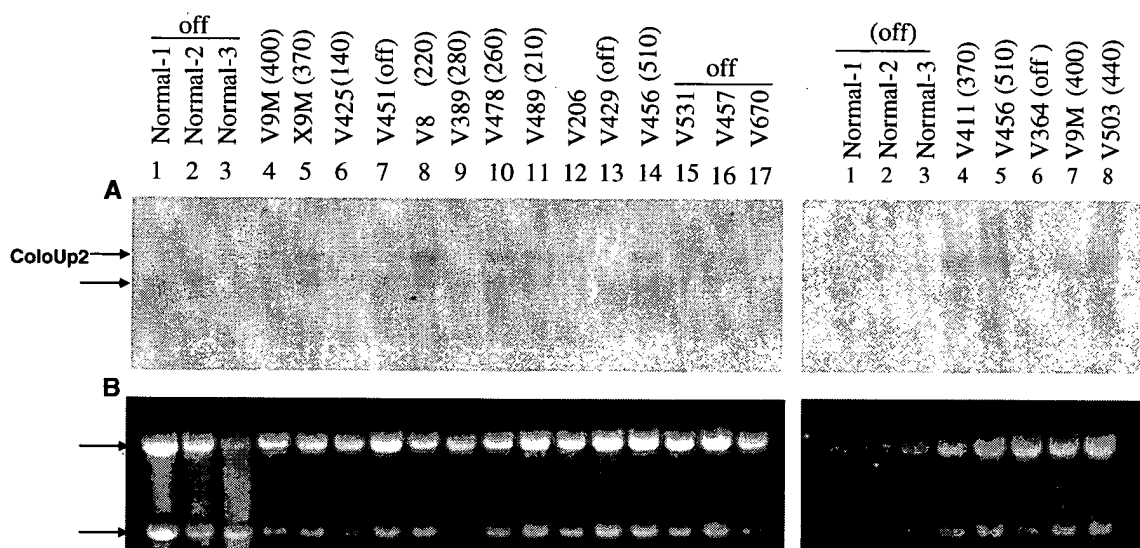


Figure 31

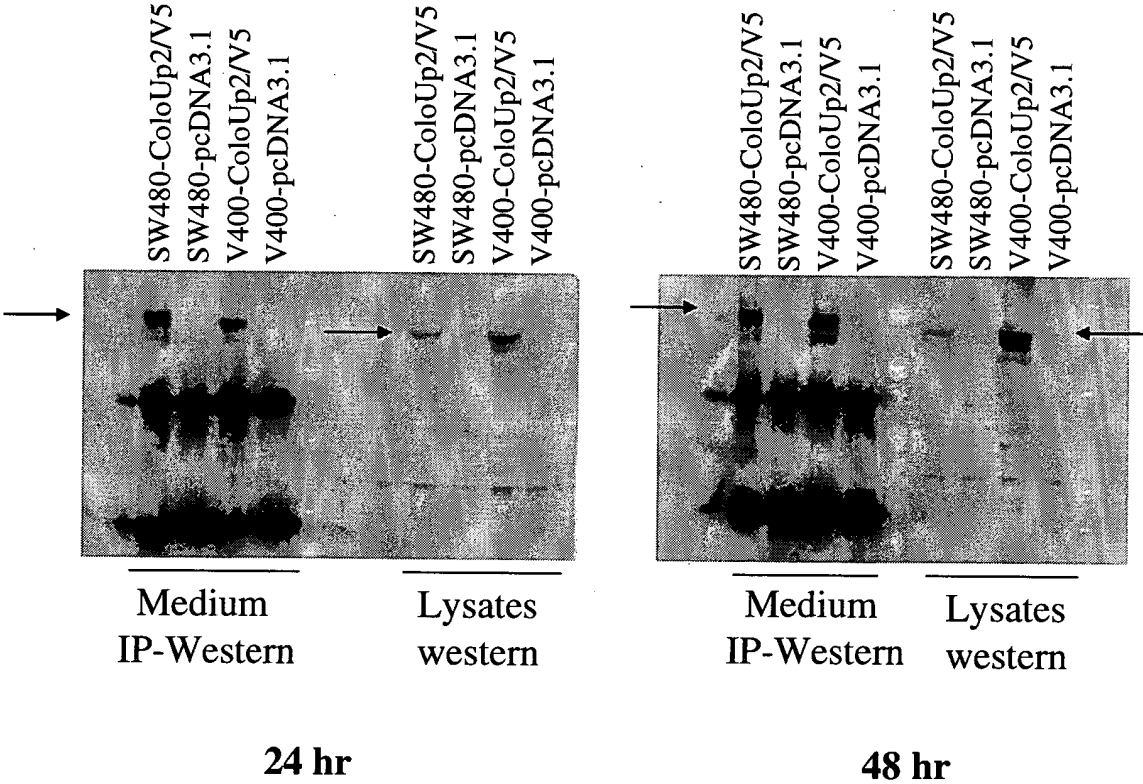


Figure 32

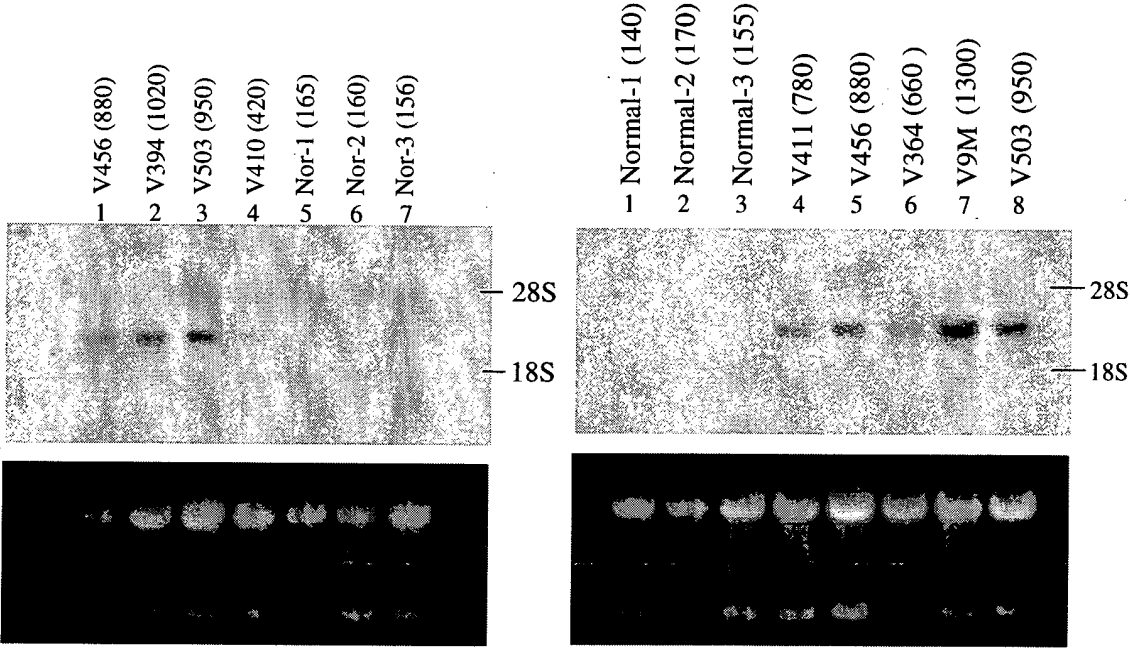


Figure 33

human foxq1 120	mouse foxq1 116	rat foxq1 116	
P P Y S Y I A L I A M A I R D S A G G R L T L A E I N E Y L M G K F P F F R G S Y T G W R N S V R H N L S L N D G F V K	P P Y S Y I A L I A M A I R D S A G G R L T L A E I N E Y L M G K F P F F R G S Y T G W R N S V R H N L S L N D G F V K	P P Y S Y I A L I A M A I R D S A G G R L T L A E I N E Y L M G K F P F F R G S Y T G W R N S V R H N L S L N D G F V K	179
			175
			175

human foxq1 180	VLRDPSRPWGKNDNYWMLNPNSEYTFEADGVFRRRRRKRLSHRRAPVLPGLRPEEAPGLPAAP	239
mouse foxq1 176	VLRDPSRPWGKNDNYWMLNPNSEYTFEADGVFRRRRRKRLSHRTVSASGLRPEEAPPGPAGT	235
rat foxq1 176	VLRDPSRPWGKNDNYWMLNPNSEYTFEADGVFRRRRRKRLSHRTVSASGLRPEEAPPGPAGT	235
Putative AD-2		
human foxq1 240	PAPAPAPASPRMRSPPARQEFERASPAAGKESSSEAIIDSILRKPFERSRRLRLDTAPGTLQWG	298
mouse foxq1 236	PAPAPAPASSPPARQEFERSSPASKESSSEAIIDSILSKPFERSRRDGDSPALGVOLPMS	295
rat foxq1 236	PAPAPASSPPARQEFERSSPASKESSSEAIIDSILSKPFERSRRDGDSPALGVOLPMS	295

human foxq1 299	mouse foxq1 296	rat foxq1 296
A A P G P P L P A F P A L E P A A P C R A M L P L G A Y G A G E P A R L G C A R E A E V P P T A P	A A P G P P L R A V P A L T P A A P G G A L L P L C A Y G A S E P T L L A S R G T E V Q P A A P	A A P G P P L R A V P A L T P A A S S G G A L L P L C A Y G A G E P T L L A S R G A E V Q P A A P
L L I A P L P A A A P	L L I A P L S T A A P	L L I A P L S T A A P

human foxq1 359 A K P L R G P - A A G C A H L Y C P L R L P A L Q A A S V R R P G P H L P Y P V E T L L A 4033
mouse foxq1 355 A K P F R G P E T A G A A H L Y C P L R L P T A L Q A A A A C G P G P H L S Y P V E T L L A 4000
rat foxq1 355 A K P F R G P E T A G A A H L Y G P L R L P T A L Q A A A A C G G P G P H L S Y R V E T L L A 4000

41/48

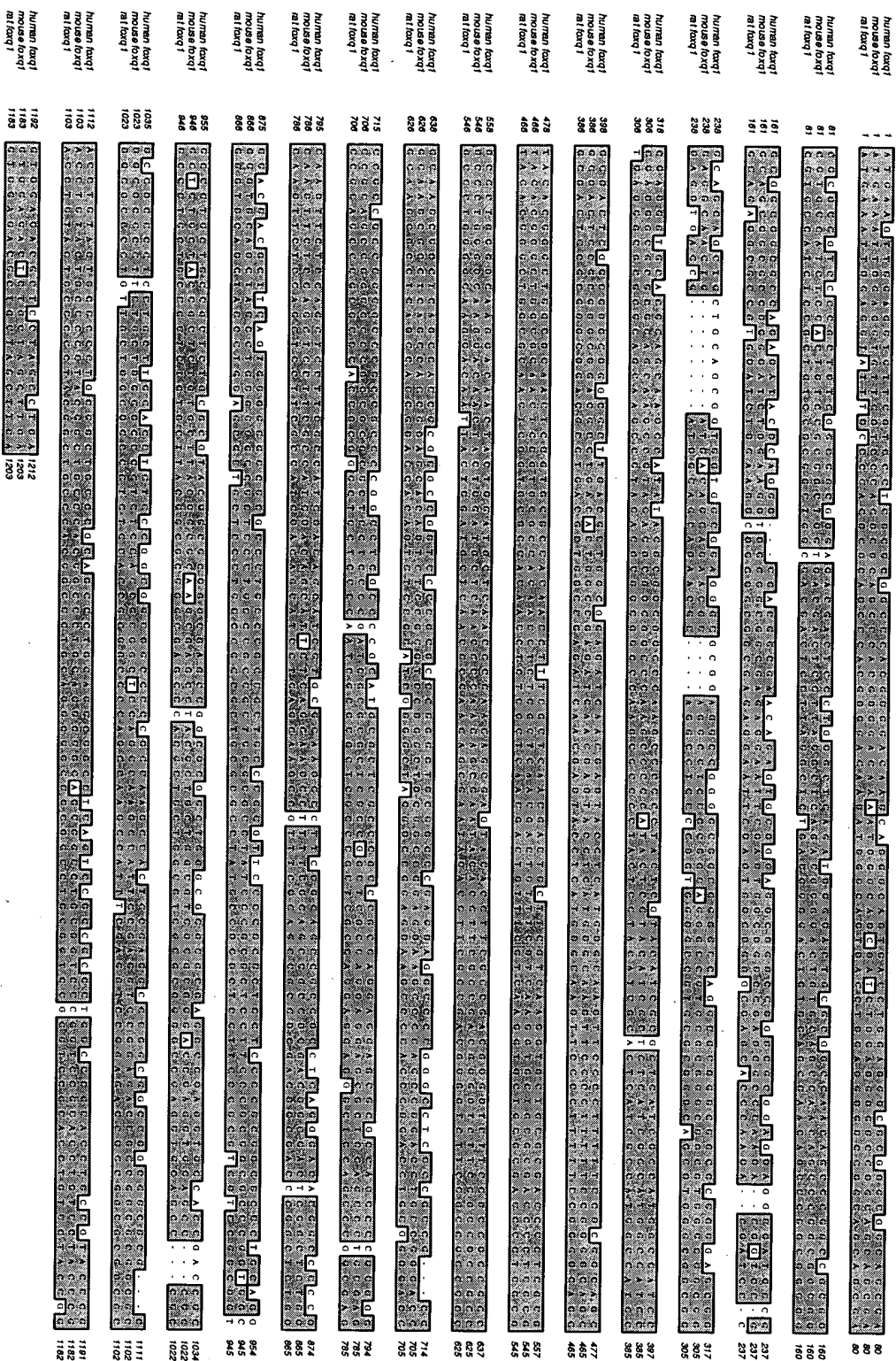


Figure 35

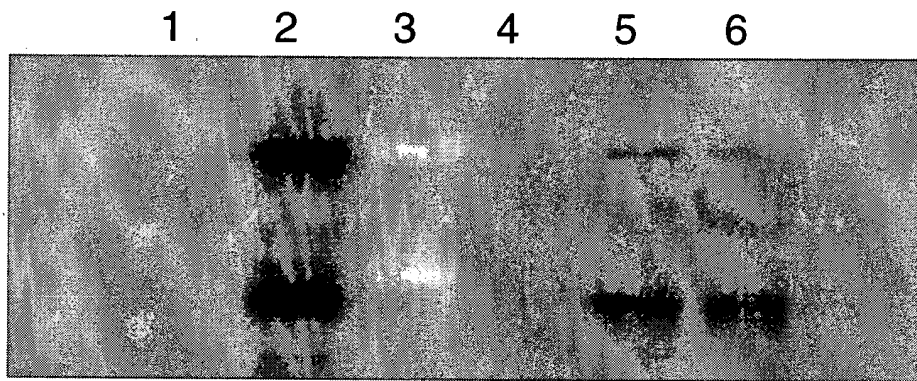


Figure 36

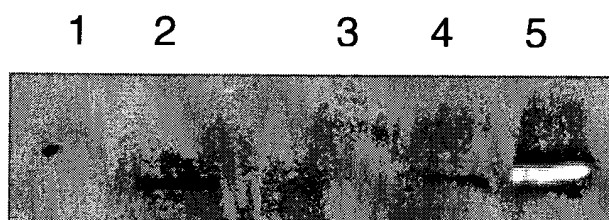


Figure 37

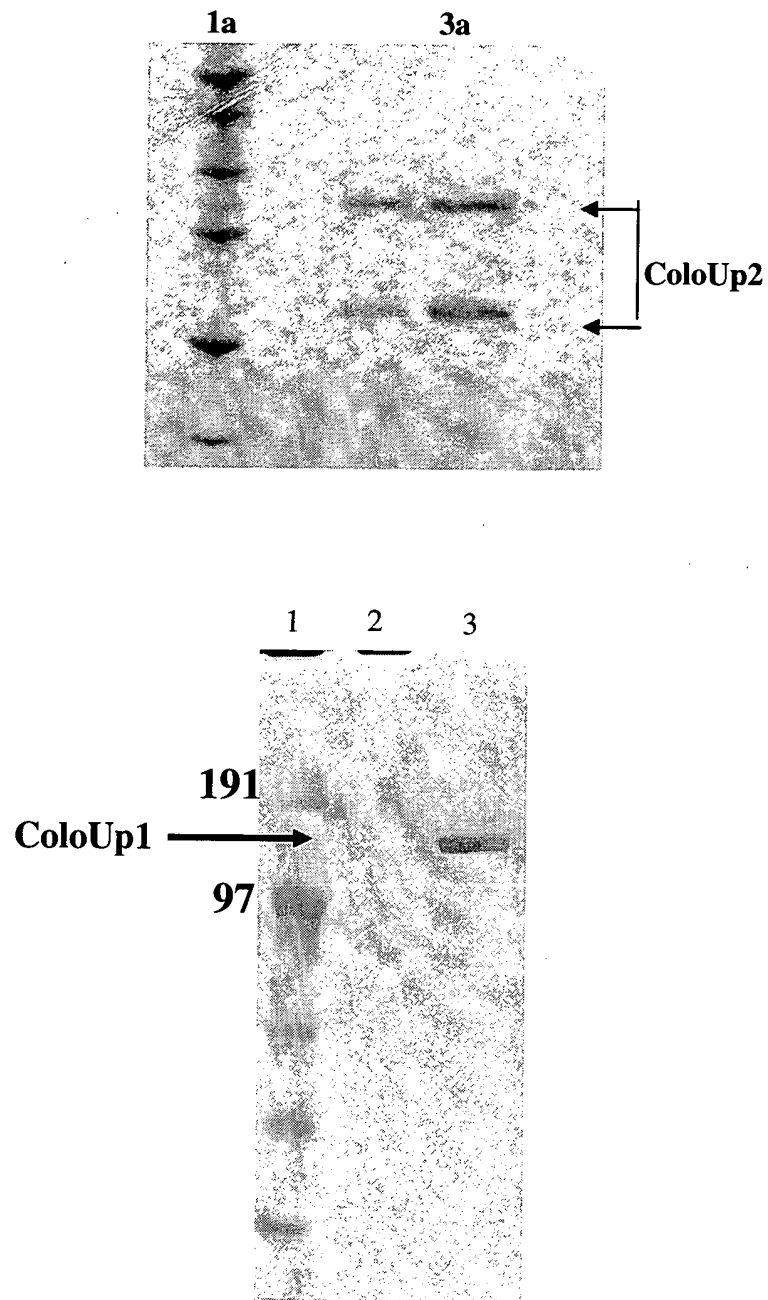


Figure 38

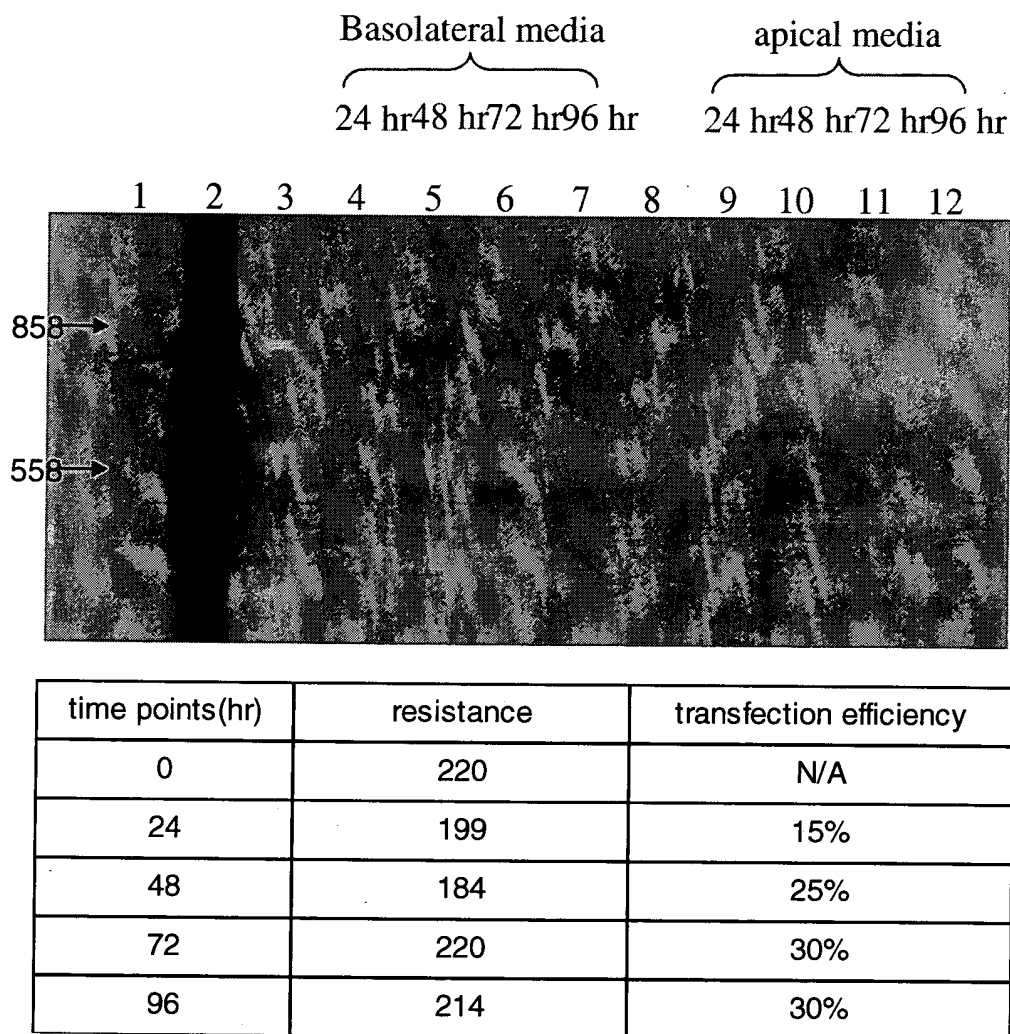
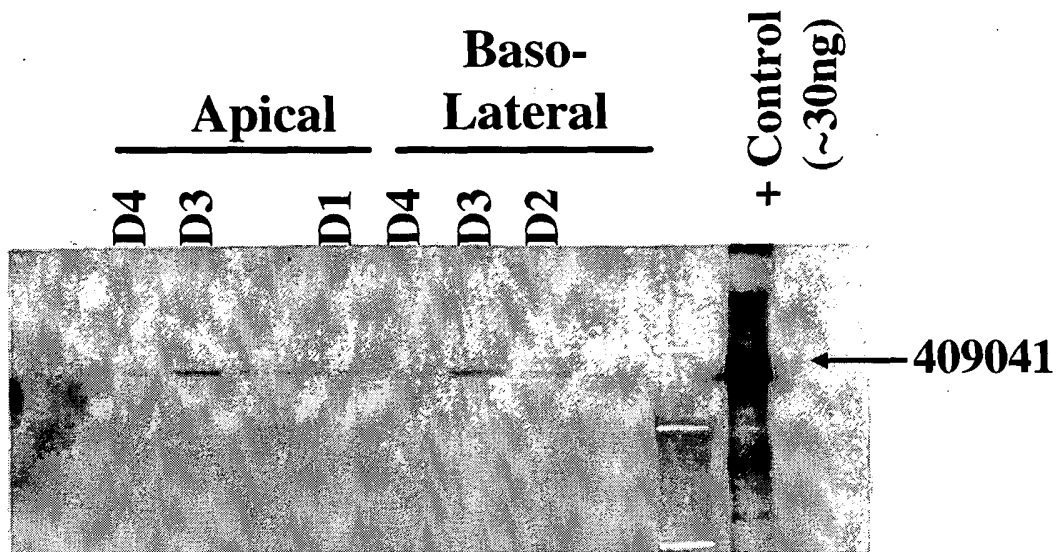


Figure 39



Day	Resistance	% GFP Exp.
0	300	0
1	415	10
2	260	20
3	206	25
4	218	25

Figure 40

Amino Acid Sequence of a Secreted C-terminal Portion of ColoUp2

AVLAAHCPFYSWKRVFLTHPATCYRTTCPGPCDSQPCQNGGTCVPEGLDGYQCL
CPLAFGGEANCALKLSLECRVDLLFLLDSSAGTTLDGFLRAKVFKRFVRAVLSE
DSRARVGVATYSRELLVAVPVGEYQDVPDLVWSLDGIPFRGGPTLTGSALRQAA
ERGFGSATRTGQDRPRRVVLLTESHSEDEVAGPARHARARELLLLGVGSEAVR
AELEEITGSPKHVMVYSDPQDLFNQIPELQGKLCRQRPGCRTLQALDLVFMLDTS
ASVGPENFAQMMSFVRSCALQFEVNPDVTQVGLVVYGSQVQTAFLDTPKTRA
AMLRAISQAPYLGGVGSAGTALLHIYDKVMTVQRGARPGVPAVVVLTGGRGA
EDAAVPAQKLRRNNGISVLVVGVPVLSEGLRRLAGPRDSLHVAAAYADLRYHQD
VLIEWLCGEAKQPVNLCKPSPCMNEGSCVLQNGSYRCKCRDGWEGPHCENRFL
RRP (SEQ ID NO:21)

Figure 41